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Education Credential Tier Evaluation

Janice H. Laurence and Peter F. Ramsberger
Human Resources Research Organization

Jane M. Arabian
OASD/FMP

Selection and Assignment Research Unit
Michael G. Rumsey, Chief

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Technical review by

Mark C. Young

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FOREWORD

Attrition—the separation of individuals from the Military Services prior to completing their terms of enlistment—presents a substantial drain on dwindling U.S. Department of Defense resources. One of the characteristics that has been repeatedly found to differentiate completers from noncompleters is education credential. Individuals with at least a high school diploma are more likely to complete their first term of service than are those without such a credential and thus are more likely to return the full benefit of training and other investments. In light of this relationship, the Military Services have invested substantial recruiting resources to enlist those who have completed at least a high school education.

In recent years, this effort has been largely successful, as very few young people have been accepted into the military with less than a high school diploma. And yet, attrition remains problematic with rates of about 30% within the first enlistment term. This paper examines the phenomenon of attrition in conjunction with education credential, as well as other characteristics that have been demonstrated to relate to the likelihood of premature separation from the military. In addition, it examines the process by which education credential is determined and entered on the records of accessions, and how that process differs across Services. Recommendations are offered regarding both how such information is collected and processed and the way in which credentials should be viewed relative to what is known about the likelihood of attrition.

ZITA M. SIMUTIS
Technical Director

EDGAR M. JOHNSON
Director

EDUCATION CREDENTIAL TIER EVALUATION

EXECUTIVE SUMMARY

Research Requirement:

The problem of early separation from military service is a costly one for the U.S. Department of Defense. The time and money invested in young people who commit to a specified period of time in the military is largely lost when that commitment is not fulfilled. One of the consistent findings that emerges from research on attrition is that rates of premature separation are higher among those who have previously failed to complete their high school education. Thus, a primary recruiting emphasis has been on enlisting individuals who possess a high school diploma.

This process has been made more complicated in recent years by the proliferation of alternative degrees and certificates. A major study was conducted in the 1980s to determine differential probabilities of attrition among those who possess various credentials. Based on the outcomes of that study, a three-tier system of credential classification was devised based on the relative odds of attrition. At the same time it was acknowledged that continual monitoring of the tier solution was required. This study was conducted in that context.

Procedure:

An analysis of credential coding systems used by each of the Military Services was undertaken. Both the Army and Air Force have their own credential coding schemes that are used in conjunction with that provided by the Military Entrance Processing Command (MEPCOM). All four Military Services also have unique sets of definitions for the various types of credentials that are presented to them. The goal of the analysis was to determine the degree to which there is consistency in the way in which this process is carried out and in its outcomes.

In addition, analyses of attrition data for several cohorts were undertaken. Trends over time were examined, along with variations that appear in rates among various credential groups. Multivariate analyses were conducted to shed further light on the phenomenon as it relates not only to education credential but other personal and service-related characteristics.

Findings:

Some variation was found in the way in which credentials are defined by the different Services. Perhaps more problematic in terms of consistency, however, is the use of credential coding schemes where the same designators are employed for different credentials and/or the categories themselves vary in terms of specificity. Several examples are provided that demonstrate the potential for confusion and the possible impact on subsequent statistics regarding credentials and attrition.

The results of the statistical analyses demonstrate that attrition does not appear to fluctuate relative to the percentage of accessions holding alternative credentials admitted in a given year. Thus, other factors are involved that influence the likelihood of attrition. Multivariate analyses reinforced the importance of education credential as a consideration in the screening of military applicants. Relative odds of attrition among all the subgroups examined varied depending upon whether education status was entered as a covariate. Without education credential in a model, spurious conclusions about the contribution of sociodemographic characteristics in predicting attrition are likely. This was particularly true among “high-risk” groups such as those with lower entrance test qualifying scores. That is, for example, controlling for education credential increased the coefficients for the odds of attrition for AFQT Category IIIB and IV personnel relative to AFQT Category IIIA.

Utilization of Findings:

The following recommendations are made based on the results of the analyses undertaken:

- All Services should use a standard education credential coding scheme, such as the one provided by the MEPCOM.
- The MEPCOM credential codes should be examined to ensure that they remain comprehensive and mutually exclusive. In addition, the utility of the coding system would be improved if they were reworked so that there is some intuitive link between the code and its meaning (e.g., HSDG for high school graduate instead of the current “L” code).
- Adult Education Diploma holders and those with One Semester of College (no high school diploma) should be classified in Tier 2, rather than Tier 1.

Further study will be required as patterns in credentials (e.g., more home schoolers) and other recruit characteristics (e.g., more female applicants) evolve to ensure that tier classification relates to subsequent attrition rates and other performance indicators.

EDUCATION CREDENTIAL TIER EVALUATION

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Education Credential Tier Evaluation

Background

Each year, on the order of 200,000 young men and women enlist in the active duty Military Services. Though military participation has been completely voluntary since 1973, each new recruit signs a contract for a specified period of service, ranging from two to six years depending upon the Service and enlistment options or conditions of service (e.g., job specialty, receipt of a monetary enlistment bonus). While the average enlistment obligation is longer and there are proportionately more careerists under the All Volunteer Force (AVF) than in the draft era, failure to complete the initial period of obligation, generally referred to as attrition, is also higher. About one-third of each accession (i.e., new recruit) cohort leaves the military before their terms are completed. These personnel losses are attributable to a variety of reasons but most (approximately 80 percent) can be categorized broadly as failure to meet minimum behavioral or performance criteria and considered adverse. While the AVF permits the expeditious separation of marginal, recalcitrant, and reluctant recruits, first-term attrition is costly, detracts from readiness, and therefore is a cause for concern. The investment in recruiting and training so-called "attritees" goes unrealized and replacements must be procured and readied for duty, increasing the burden on recruiting and training resources.

A primary means of managing first-term attrition of enlisted personnel is by selection of applicants who possess a traditional high school diploma or similar credential. Research has demonstrated repeatedly that attrition is higher among those who fail to complete high school as compared to those who obtain a diploma (Cheatham, 1978; Hand, Griffith, & Mobley, 1977; Flyer, 1963; Laurence, 1984, 1987; Smith & Kendall, 1980). The differences in attrition rates by education credential are substantial. It is estimated that a high school diploma graduate has almost an 80 percent probability of completing a three-year term of enlistment, as compared to a 60 percent probability for nongraduates (Department of Defense, 1981; Laurence, 1987). For those with alternative credentials (e.g., General Educational Development (GED) certification), the attrition rates more closely resemble nongraduates than those with a diploma (Elster & Flyer, 1982; Laurence, 1987). Although the strength of the relationship varies, differential attrition rates by educational level is a consistent finding across all four Services, race, and gender. The same results have also been found in the militaries of other countries; specifically the United Kingdom, Australia, and Canada (Sinaiko & Schefflen, 1980, 1982; Walker, in preparation).

Given the reliability of the relationship between education credential and attrition, the assessment of this status is a key element in the military application process. The Military Entrance Processing Command (MEPCOM) maintains the Military Enlistment Processing Reporting System (MEPRS) as a means of collecting and documenting information about applicants, including their educational achievement. One of the

challenges faced in this regard is the proliferation of alternative degrees and credentials that has occurred to meet the various needs, abilities, and circumstances of students nationwide.

The primary focus of much of the early work (1970s) regarding educational credentials and military service considered three levels of degree status: no high school diploma, high school equivalency (primarily GED certification), and regular high school diploma graduate. Over the years, various other educational paths and credentials have developed to accommodate a wider range of individual learning styles, needs, and situations. These include alternative schools, correspondence courses, and vocational/technical programs. In addition, amid a flurry of stories in the news media regarding declining student test scores and high school graduates lacking even the most fundamental of basic skills, came the advent of competency testing in the 1970s. The goal of this movement was to verify that students possess specific skills that are judged to be essential hallmarks of someone with a high school diploma. Such skills generally center on reading, mathematics, and language usage. An outgrowth of competency testing has been a move to offer different types of diplomas or to display on diplomas information regarding students' curriculum type and associated abilities. Such variations on the traditional high school diploma include honors diplomas, college preparatory or academic diplomas, vocational or technical diplomas, and diplomas with proficiency endorsements.

Another category of credential that resulted from competency testing was one to award to individuals who completed the required courses for a traditional high school diploma but failed the competency test(s). Various certificates are now being issued to these *almost* graduates. In essence, these become proof of attendance and/or coursework completion, rather than indicators of any specific skills attained.

In the early 1980's, the Department of Defense initiated a detailed study of the relationship between educational credentials, other background characteristics, and adaptability for military service. The Educational and Biographical Information Survey (EBIS) was administered to some 74,000 applicants and new recruits over a five month period in 1983. The performance of EBIS respondents who entered the military during this period was then tracked over a three-year period to determine the empirical relationship between educational background and attrition. The results supported a three-tier classification of credentials based on the "staying power" of those who held them:

Tier One

High school diploma (and higher)

Completion of one semester of college (no traditional diploma)

Tier Two--Alternative credentials

Test-based equivalency diploma (e.g., GED)
High school certification of attendance
Adult education diploma
Correspondence school diploma
Occupational program certificate
Home school diploma

Tier Three--Non-high school graduate

As detailed in Laurence (1993), the empirical foundation provided by the EBIS results did little to still the ire of those who felt that the three-tier system disparaged alternative credentials. In the end, a compromise was reached to produce a revised tier system. The primary change from the above listing was that adult education diplomas were granted Tier 1 status, along with regular high school diplomas and post-secondary education.

Since the implementation of the revised tier system, attrition rates by credential within the system have been reported annually. This education credential tier evaluation will not only present and analyze attrition differences among education credentials and the concordance of tier placement but also examine the reliability of education credential coding. The assessment of tier consistency begins with a review of the reliability of education credential coding followed by tabulations of attrition by credential (including attrition confidence intervals for credentials). To better explicate the variation in attrition rates by credential, the results of multivariate attrition analyses controlling for sociodemographic factors coinciding with education credential are also described. Recommendations for improving the tier system and other methods to reduce attrition are offered.

Education Credential Coding

In addition to depicting the array of degrees and credentials that must be considered as part of the military screening process, Table 1 reveals another complication. The Services maintain their own set of education credential codes in addition to that provided by MEPCOM. The Army's Recruit Quota System (REQUEST), and the Air Force's Procurement Management Information System (PROMIS) continue to use distinct sets of codes.

Nevertheless, overall conformance to the MEPRS is quite high across Services. For instance, both the Navy and Marine Corps use the DoD codes, and largely adhere to the category definitions. Minor variations exist regarding factors such as

Table 1: Education Credential Tiers, Codes and Definitions

(TIER ONE CREDENTIALS BY DoD/SERVICE)

Education Credential	MEPRS Code/Def	Army Code/Def	Navy Code/Def	MC Code/Def	AF Code/Def
Currently in HS	9--Currently in, not senior	CHS--Currently Jr.(USAR training program only)	-- --	-- --	-- --
HS Senior	S--Currently HS senior	HSSR--in established HS, expected to graduate within 365 days	S--Intended to graduate, currently in DEP	-- --Attending HS as senior	-- --
HS Diploma	L--diploma from 12-year or grade day program of classroom instruction	HSDG--Completed 12 year or grade day program of classroom instruction	L--Completed 12-year or grad day program of classroom instruction If school not accredited, must be judged by Navy recruiting District Commanding Officer	L--Completed 12-year or 12th grade day program of classroom instruction. Traditional HS, although includes some alternate schools	D--Completed 12-year or 12th grade program of classroom instruction & has locally issued diploma. Those with 15 or more semester hours (22 quarter hrs) at regionally accredited college listed in current educational directory considered HSGs or higher. Those who complete adult ed program considered HSG. Applicants who complete HS early must present a letter s.
Adult Education Diploma	B--Secondary school diploma based on completing an adult ed or "external" diploma program.	ADUL--Secondary school diploma based on completing an adult ed or "external" diploma program. Must be based on class attendance and not issued solely on the basis of a test.	B--Secondary school diploma based on completing an adult ed or continuation HS program. If school not accredited, certified, or state-recognized, Commanding Officer, Navy Recruiting District Officer, Navy Recruiting District will ascertain status.	B--Secondary school diploma based on completing an adult ed or continuation HS program. To categorize as Tier 1, program must include attendance that is comparable to traditional high school.	D--Secondary school diploma based on completing an adult ed or "external" diploma program, regardless of sponsorship.
Completed one semester college	8--HS grad or alternate degree holder who completed at least 15 semester or 20 quarter hours of college level credit. Credit earned through testing, or for pursuit of adult ed, or for HS equivalency is not applicable.	HSDC--Attended post-secondary institution listed in the CORPA book, completed 15 semester or 22 quarter hours of college-level credits from degree-granting inst., or 675 clock hours from post-secondary voc-tech inst. Credits earned through testing for HS equivalency not acceptable.	8--Non-HS graduate or alternate HS credential holder completing 15 semester or 22 quarter hours of college-level credit. Credit earned through testing or for pursuit of HS equivalency not applicable.	8--Non-HS grad or alternate HS credential holder completing one semester of college/post-secondary work (15 semester, 22 quarter, or 675 classroom hrs). Must have earned credits from institution listed in AIPE. Must have been earned through classroom attendance. If earned as part of HS equivalency, through testing or as part of adult ed program not applicable	E--Completed 15-29 semester or 22-44 qtr hrs of post-secondary ed. Non-HS credential holder with 15 semester/22 qtr hrs of college level credit. Credit earned through testing /for adult ed/HS equivalency not applicable. F--30-59 semester 45-89 qtr hrs post-secondary G--60-89 semester/90-134 qtr hrs post-secondary J--90 semester/135 quarter hrs but not awarded BA

Table 1: Education Credential Tiers, Codes and Definitions (Continued a)

(TIER ONE CREDENTIALS BY DoD/SERVICE (Continued))

Education Credential	MEPRS Code/Def	Army Code/Def	Navy Code/Def	MC Code/Def	AF Code/Def
Associate Degree	D--Certificate upon completion of 2-year program at jr. college, university or tech institute	ASSC--Certificate upon completion of 2-year program at jr. college, university or tech institute	D--Associate of Arts or higher degree from an accredited jr. college, college or university	D--Certificate upon completion of 2-year program at jr/community college, university or tech institute	H-- associate degree. A 2-year program at jr. college, university or tech institute
Professional Nursing	G--A certificate conferred upon completion of a 3-year hospital school of nursing	NURS--Certificate conferred upon completion of a 3-year hospital school of nursing	G--no definition given	G--Certificate conferred upon completion of a 3-year hospital school of nursing	G--No definition listed
BA	K--Certificate conferred upon completion of 4-year college program other than a first professional degree	BACH-- Certificate conferred upon completion of 4-year college program other than a first professional degree	K--Associate of Art or higher degree from an accredited junior college, college, or university	K-- Certificate conferred upon completion of 4-year college program other than a first professional degree	N--Awarded a baccalaureate degree.
MA	N--Certificate conferred upon completion of additional academic requirements beyond the BA or first professional degree but below Ph.D.	MAST-- Certificate conferred upon completion of additional academic requirements beyond the BA or first professional degree but below Ph.D.	N--Associate of Art or higher degree from an accredited jr. college, college or university	N-- Certificate conferred upon completion of additional academic requirements beyond the BA or first professional degree but below Ph.D.	P--Awarded a Master's Degree
Post-Master's Degree	R--A certificate conferred upon completion of additional academic requirements beyond the MA level but below the Doctorate Level	PMAS-- A certificate conferred upon completion of additional academic requirements beyond the MA level but below the Doctorate Level	R--No definition listed	R-- A certificate conferred upon completion of additional academic requirements beyond the MA level but below the Doctorate Level	--
Doctorate Degree	U--A certificate conferred upon completion of the highest academic achievement within an academic field, excluding honorary degrees and first professional degrees	DOCT-- A certificate conferred upon completion of the highest academic achievement within an academic field, excluding honorary degrees and first professional degrees	U--No definition listed	U-- A certificate conferred upon completion of the highest academic achievement within an academic field, excluding honorary degrees and first professional degrees	R--No definition listed
First Professional Degree	W--Certificate conferred upon completion of academic requirements for first degrees awarded in selected professions: Architecture, CPA, DSC, POD.D., DDS, DMD, MD, OD, DO, Pharmacy, Veterinary Medicine, Law, Theology, or other first professional degree	PROF--Certificate conferred upon completion of academic requirements for first degrees awarded in selected professions: Architecture, CPA, DSC, POD.D., DDS, DMD, MD, OD, DO, Pharmacy, Veterinary Medicine, Law, Theology, or other first professional degree	W--No definition given	W--Certificate conferred upon completion of academic requirements for first degrees awarded in selected professions: Architecture, CPA, DSC, POD.D., DDS, DMD, MD, OD, DO, Pharmacy, Veterinary Medicine, Law, Theology, or other first professional degree	S--No definition given
Second/Third Professional Degree	-- --	-- --	-- --	-- --	T--No definition given

Table 1: Education Credential Tiers, Codes and Definitions (Continued b)

(TIER TWO CREDENTIALS BY DoD/SERVICE)

Education Credential	MEPRS Code/Def	Army Code/Def	Navy Code/Def	MC Code/Def	AF Code/Def
Occupational Program Certificate of Attendance	C--A non-correspondence school, duration at least six months. Must have completed 11 years of day school.	VOCT-- A non-correspondence voc, tech, or proprietary school, duration at least six months. Must have completed 11 years of day school.	C-- A non-correspondence voc, tech, or proprietary school, duration at least six months. Must have completed 11 years of day school. ...and possesses a certificate of attendance of completion indicating such.	C-- A non-correspondence voc, tech, or proprietary school, duration at least six months. Must have completed 11 years of day school. ...and possesses a certificate of attendance of completion indicating such. ...has a civilian certificate of equivalence of HS	C-- A non-correspondence voc, tech, or proprietary school, duration at least six months. Must have completed 11 years of day school. ...and possesses a certificate of attendance of completion indicating such. ...has a civilian certificate of equivalence of HS
High School Certificate of Attendance	J--An attendance-based HS certificate or diploma. Based on course completion rather than test. Not considered an alternate HS credential	ATTN-- An attendance-based HS certificate or diploma. Based on course completion rather than test. Not considered an alternate HS credential s	J--Those fail-to-graduates who have a certificate of completion or signed document by an authorized school official	J--An attendance-based HS certificate, diploma, or verification letter substantiating attendance, together with transcripts showing attendance through the 12th grade. Based on course completion rather than test.	C--An attendance-based HS certificate or diploma. Based on course completion, not a test. Has a civilian certificate of equivalence of HS. Not considered HS diploma, considered an alternate HS credential
Correspondence School Diploma	7--Secondary school diploma or certificate awarded upon completion of correspondence school coursework, whatever the source. Considered and alternate HS credential	CORR-- Secondary school diploma or certificate awarded upon completion of correspondence school coursework, whatever the source. Considered and alternate HS credential	7--Has earned a HS diploma or certificate from correspondence school accredited by the Accrediting Comm. of Distance Ed and Trng Council	7-- Secondary school diploma or certificate awarded upon completion of correspondence school coursework, whatever the source. Considered and alternate HS credential	C-- Secondary school diploma or certificate awarded upon completion of correspondence school coursework, whatever the source. Considered and alternate HS credential
Home Study Diploma	H--Secondary school diploma or certificate, typically awarded by the state, based upon certification by parent or guardian that individual completed education at home. Considered an alternate HS credential	HOME-- Secondary school diploma or certificate, typically awarded by the state, based upon certification by parent or guardian that individual completed education at home. Considered an alternate HS credential	H--Secondary school diploma or certificate, typically awarded by the state, based upon certification by parent or guardian that individual completed education at home. Considered an alternate HS credential. An applicant who has earned a HS diploma or certificate from a home study school that is accredited by the Accrediting Commission of the Distance Ed and Trng Council	H--Secondary school diploma or certificate, typically awarded by the state, based upon certification by parent or guardian that individual completed education at home. Considered an alternate HS credential	C--Secondary school diploma or certificate, typically awarded by the state, based upon certification by parent or guardian that individual completed education at home. Considered an alternate HS credential

Table 1: Education Credential Tiers, Codes and Definitions (Continued c)

(TIER TWO CREDENTIALS BY DoD/SERVICE)

Education Credential	MEPRS Code/Def	Army Code/Def	Navy Code/Def	MC Code/Def	AF Code/Def
Test-Based Equivalency Diploma	E--Diploma or certificate of GED or other test-based HS equivalency diploma. Includes State-wide testing programs. Not to be considered a HS diploma. Considered an alternate HS credential.	GEDH-- Diploma or certificate of GED or other test-based HS equivalency diploma. Includes State-wide testing programs. Not to be considered a HS diploma. Considered an alternate HS credential.	E-- Diploma or certificate of GED or other test-based HS equivalency diploma. Includes State-wide testing programs. Not to be considered a HS diploma. Considered an alternate HS credential.	E-- Diploma or certificate of GED or other test-based HS equivalency diploma. Includes State-wide testing programs. Not to be considered a HS diploma. Considered an alternate HS credential.	C-- Diploma or certificate of GED or other test-based HS equivalency diploma. Includes State-wide testing programs. Not to be considered a HS diploma. Considered an alternate HS credential.
Credential Near Completion	M--Status of individual who is currently pursuing completion of one of the credentials listed in Tier 2.	ENRL--currently pursuing Tier 1 via adult ed or college-meet all requirements for graduation--if no diploma must have letter stating why and when. HS ed program must be expected to finish in 365 days. Clock hours = 675.	M--Applicants pursuing an accredited program that will yield HSDG status. Will obtain required credits within 180 days. May be enlisted in DEP.	M--Status of an individual who is currently pursuing completion of one of the alternate/continuation HS credentials.	B--Status of an individual who is currently pursuing completion of one of the alternate credentials listed in Tier 2. Has successfully completed GED HS level battery, but does not have HS diploma
Alternate/Continuation HS	-- --	-- --	-- --	Y--Special interest code. diploma from HS to which an individual has been assigned as an alternate to regular HS. If diploma doesn't fall in code Z should be Tier 2 or referred for determination.	-- --
Alternate/Continuation HS	-- --	-- --	-- --	Z--Special Interest Code. Diploma from HS to which person has been assigned to complete HS ed. For Tier 1, issuing institution must have had the same day-time course/graduation requirements, same days, weeks, hours of attendance, and offered same diploma as school that made assignment.	-- --

(TIER THREE CREDENTIALS BY DoD/SERVICE)

Education Credential	MEPRS Code/Def	Army Code/Def	Navy Code/Def	MC Code/Def	AF Code/Def
Education Credential Less Than HS Diploma	I--Status of an individual who is not currently attending HS and who is neither a HS graduate or an alternate HS credential holder.	NHSG-- An individual who has not graduated from HS or has not received an alternate credential	I--No definition given	I-- Status of an individual who is not currently attending HS and who is neither a HS graduate or an alternate HS credential holder.	A-- Status of an individual who is not currently attending HS and who is neither a HS graduate or an alternate HS credential holder.

accreditation of degree-granting institutions, which is required by the Navy for high school, adult education, correspondence school, and home study diplomas. Such accreditation can be from the state in which the school is based or from some other official body that performs this function such as the Distance Education and Training Council. This requirement is not explicitly stated in the MEPRS definitions.

Examination of the Army categories shows that, although the actual codes are different than those established by MEPCOM, the classification definitions are virtually identical. The obvious advantage to the Army codes is that they are more readily interpretable than the MEPRS. In the latter case, the derivation of the codes over time led to a combination of alpha and numeric characters with seemingly little relationship between the code itself and the content of the category. The REQUEST codes at least provide a hint at the meaning of the groups to which they are applied (e.g., HSSR = High School Senior).

Clearly, the major variance in the coding systems comes with the Air Force's PROMIS. For instance, one code (D) is used to define both high school graduates and adult education diploma holders. In addition, a single code (C) is applied to all Tier 2 credentials except "credential near completion." It is true that, for the most part, the PROMIS credential category definitions are similar to those provided by MEPCOM and the other Services. The potential problem centers around the degree to which those applying the codes attend to the distinctions inherent in the MEPRS breakdown that may become blurred by PROMIS codes that generally cover a wider range of categories. That is, if the concern is in determining someone's eligibility to enlist in the Air Force, and this eligibility is determined using PROMIS codes, then the assigning of the MEPRS codes is an information-only exercise. The Air Force wants to know if someone is a Code C--a Tier 2 candidate. The Tier 2 category into which that individual falls is relatively unimportant, and thus may not be attended to with the precision required by the other Services.

Another potential problem with PROMIS is that certain designators are the same as those found in MEPRS but with different meanings. The overlapping codes are as follows:

MEPRS

D = Associates Degree

E = Test-based equivalency

H = Home Study Diploma

C = Occupational Program

PROMIS

D = High School Diploma
Adult Education Diploma

E = One Semester of College

H = Associates Degree

C = Occupation Program

Certificate of Attendance

Correspondence School

Home Study Diploma

Test-Based Equivalency

If the individual who collects and codes this information simply transfers the PROMIS code into the MEPRS field, then someone with a high school degree will be counted as having an Associates Degree, and so forth.

Thus far, this discussion has highlighted two areas of potential confusion regarding educational credentials as they are used for determining military eligibility. The first is the ever-increasing variety of citations, certificates, and degrees available from a growing array of institutions. The second is the variation between DoD and Service definitions of credential categories, along with Service-specific education credential coding schemes. Evidence concerning the extent to which these factors result in inaccuracies in credential coding can be gleaned by examining attrition rates across education categories and military branches.

Table 2 shows the 24-month attrition rates for 1988-1993 non-prior Service (NPS) accessions by credential groups and Service. Looking first at the numbers of accessions, it becomes apparent that the Air Force has the highest percentage of high school graduates (96 percent), followed by the Marine Corps (93 percent), Army and Navy (88 percent). Given these figures, the percentages in the other credential groups are necessarily small. Nonetheless, the 4 percent of Army accessions with high school equivalency certification and the 3 percent with two years of college do represent some 34,000 recruits.

Focusing on those credentials with substantial numerical representation, the figures in Table 2 are relatively stable across the Army, Navy, and Marine Corps.¹ The largest deviations across these three Services occur in the high school nongraduate, adult education diploma, and certificate of attendance groups. In each case, the Navy has the highest level of attrition, and the Marine Corps the lowest.

There are several notable instances where Air Force attrition rates vary substantially from those in the other Services. As compared to figures for DoD as a whole, Air Force attrition is 21 percent lower among those with one semester of college and those with a certificate of attendance, 11 percent lower in the high school equivalency and "less than high school diploma" groups, and 8 percent lower among home school diploma holders. The preceding discussion highlighted that one possible source of confusion regarding the credentials of Air Force accessions lies in the overlap

¹ The deviations that occur in categories with relatively small number of accessions should be treated with some caution. This is highlighted by the large confidence intervals as shown under the attrition percentages in Table 2. These would suggest, for instance, that if we were to have data for the entire population or a duplicate population of Army NPS accessions with an occupational program certificate, the attrition rate could range from 15.23 percent to 47.37 percent.

Table 2. Twenty-Four Month Attrition for FY 1988-1993 NPS Accessions by Education Credential and Service

Tier/Education Credential ^a	Army		Navy		Marine Corps		Air Force		Total DoD	
	N	% Attrition	N	% Attrition	N	% Attrition	N	% Attrition	N	% Attrition
Tier 1										
High School Graduate ^b	438,765	23.6 (±00.13)**	375,518	23.2 (±00.14)	179,339	23.2 (±00.20)	204,942	18.0 (±00.17)	1,198,564	22.5 (±00.07)
College: One Semester	9,696	38.0 (±00.97)	6,833	37.1 (±01.15)	2,124	35.3 (±02.03)	1,176	15.3 (±02.06)	19,829	36.0 (±00.67)
College: 2 Years or More	16,173	21.6 (±00.63)	7,214	20.6 (±00.93)	1,655	24.1 (±02.06)	4,680	14.9 (±01.02)	29,722	20.5 (±00.46)
Adult Education	5,201	35.7 (±01.30)	8,604	38.5 (±01.03)	2,141	33.2 (±01.99)	137	34.3 (±07.95)	16,083	36.8 (±00.75)
Tier 2										
H.S. Equivalency	18,205	40.5 (±00.52)	13,977	42.2 (±00.55)	2,414	43.5 (±01.75)	1,445	30.1 (±01.54)	36,041	40.9 (±00.36)
Occupational Program Cert.	32	31.3 (±16.07)	138	26.1 (±07.33)	25	44.0 (±19.46)	101	29.7 (±08.91)	296	29.4 (±05.19)
H.S. Cert. of Attendance or Completion	112	35.7 (±08.87)	1,074	37.7 (±02.90)	3,148	33.2 (±01.65)	100	13.0 (±06.59)	4,434	33.9 (±01.39)
Correspondence School Dipl.	24	29.2 (±18.19)	21	23.8 (±18.21)	124	41.1 (±08.66)	5	0	174	36.2 (±07.14)
Home School Diploma	19	36.9 (±21.70)	42	38.1 (±14.69)	49	38.8 (±13.64)	227	12.3 (±04.27)	337	20.8 (±04.33)
Tier 3										
Less Than H.S. Diploma	7,567	41.3 (±01.11)	12,332	44.5 (±00.88)	817	38.1 (±03.33)	267	31.8 (±05.59)	20,983	42.9 (±00.67)
Total	496,547	24.8 (±00.12)	431,827	24.9 (±00.13)	192,497	23.9 (±00.19)	213,221	18.0 (±00.16)	1,334,092	23.6 (±00.07)

^aCodes A, M, S, 2, 3, 4, 5, 6, 9 and missing excluded (N = 7,280). ^bExcludes old Code 2 for diploma graduate (N = 3,799).

** Numbers in parentheses refer to the 95% confidence interval of the attrition rate.

between MEPRS and PROMIS codes with different meanings. If there is a substantial problem with the Air Force codes being entered in the MEPCOM fields, we would expect: similar or slightly higher rates of attrition among Air Force Associates Degree holders, some of whom are simply high school graduates or even adult education diploma holders; lower rates of attrition among high school equivalency holders, some of whom have actually completed one year of college; and lower rates of attrition among home school diploma holders, some of whom actually have a two-year post-secondary degree.

Discussions with Air Force Recruiting Headquarters confirmed the miscoding of home school diplomas as associates degrees and acknowledged the possibility of other potential coding confusions (e.g., the overlapping codes may be presenting a problem in the high school equivalency category). The relatively low attrition rate among high school equivalency degree holders could be the result of substantial numbers of individuals who have completed one year of college being coded as equivalency diploma holders. Furthermore, discussions with Air Force Recruiting revealed the likelihood that in addition to including nongraduates, the Air Force is including traditional high school diploma graduates with at least one semester of college in the one semester of college category. This practice would deflate the degree of attrition reported for this credential category. Finally, the Air Force coding system does not differentiate among alternative credentials to the same extent as MEPRS and there is no distinction in PROMIS codes between adult education diplomas and traditional high school diplomas (both coded as D).

There are potential policy implications of these coding confusions. When the Department of Defense and the Military Services adopted the revised tier system in 1988, they agreed to monitor the system and make revisions as necessary in the tier placement of various credentials. The Air Force data incongruencies detract from the reliability of the DoD-reported codes. In the case of Tier 2, it reduces the ability to differentiate among credentials. Within Tier 1, the implications are more serious. The current situation would *seem* to provide evidence that Home School Diplomas should be moved to Tier 1 and that those with One Semester of College should remain in Tier 1. The Tier 1 problem is salient because the numerical base (although in error) within the Air Force is enough to affect the DoD attrition rates. For similar reasons, while contributing to reporting error, the systematic lack of distinction between Tier 2 credentials and adult education and traditional diploma holders by the Air Force does not overpower the attrition statistics of the other Services. However, in light of the relatively low representation of adult diploma holders in the Air Force, the lack of distinction between such credentials and traditional diploma holders may be misinterpreted as an unofficial policy to limit the enlistment of the former. In short, these coding errors introduce systematic error into the reporting system. Given Congressional interest in the Tier system, including continued monitoring and adjustment, these coding inaccuracies may have detrimental consequences for recruit quality and attrition should changes be requested on the basis of erroneous data.

Review of Education Credential Tier Placement

Table 3 shows 24-month attrition rates by Service and education credential for FY 1988 through 1993 non-prior service accessions with corrections for the Air Force Home School Diploma miscoding. The entries within this category were assigned to the "College: 2 Years or More" category and attrition rates recalculated accordingly. No other corrections were made (i.e., the "College: One Semester category was not altered). This corrected table is not a permanent "fix" for the miscodings but is preferable to uncorrected data for evaluating tiers.

Although the average enlistment term is four years, a two year or 24-month criterion was chosen for this evaluation. The rationale for examining attrition at this point is that it enables the inclusion of more cohorts and thus ensures a more adequate sample within each credential and hence more stable attrition rates. Most first-term attrition occurs by this point in time. Further, although attrition may increase by around 10 percentage points at the 36-month mark, the patterns among credentials is consistent.

Just under one-quarter (23.6 percent) of accessions from these cohorts left before completing even two years of their contracted enlistment terms. This overall rate is heavily weighted by the loss rates for traditional high school diploma graduates (22.5 percent attrition) who together with college degree holders (20.4 percent attrition) account for over 90 percent of accessions in these years. In other words, the preponderance of high school graduates within Tier 1 in contrast to adult education diploma holders, recruits with one semester of college, and Tier 2 credential recipients holds attrition at the 20 percent level rather than at the 35 to 40 percent levels for alternative credential holders.

On the basis of 24-month attrition rates, DoD's three tier categorization scheme appears sound. However, there are some tier placements that seem awry or at least questionable at this time. In the case of adult education holders, it appears that Tier 1 placement is not appropriate. In each Service, over 30 percent of recruits with adult education credentials did not complete two years of service. Another conspicuous credential within Tier 1 is "one semester of college." Except within the Air Force, where the data are suspect, those with some college but no traditional diploma had higher attrition rates than other Tier 1 credential holders. On the basis of attrition rates, Tier 2 placement seems more appropriate for these credentials. The relatively high attrition rate for nongraduates who have completed one semester of college is consistent with a pattern of dropping out of both high school and college. Navy personnel policy analysts and education specialists suggested that further evaluation of tier placement for this credential group would benefit from distinguishing between academic (semester or quarter hours) versus vocational program (clock hours) attendance. The former might represent the second time drop outs whereas the latter may not.

Table 3. Twenty-Four Month Attrition for FY 1988-1993 NPS Accessions by Education Credential and Service (amended)

Tier/Education Credential ^a	Army		Navy		Marine Corps		Air Force		Total DoD	
	N	% Attrition	N	% Attrition	N	% Attrition	N	% Attrition	N	% Attrition
Tier 1										
High School Graduate ^b	438,765	23.6 (±00.13)**	375,518	23.2 (±00.14)	179,339	23.2 (±00.20)	204,942	18.0 (±00.17)	1,198,564	22.5 (±00.07)
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H.S. Cert. of Attendance or Completion	112	35.7 (±08.87)	1,074	37.7 (±02.90)	3,148	33.2 (±01.65)	100	13.0 (±06.59)	4,434	33.9 (±01.39)
Correspondence School Dipl.	24	29.2 (±18.19)	21	23.8 (±18.21)	124	41.1 (±08.66)	5	0	174	36.2 (±07.14)
Home School Diploma	19	36.9 (±21.70)	42	38.1 (±14.69)	49	38.8 (±13.64)	--	--	110	38.2 (±09.08)
Tier 3										
Less Than H.S. Diploma	7,567	41.3 (±01.11)	12,332	44.5 (±00.88)	817	38.1 (±03.33)	267	31.8 (±05.59)	20,983	42.9 (±00.67)
Total	496,547	24.8 (±00.12)	431,827	24.9 (±00.13)	192,497	23.9 (±00.19)	213,221	18.0 (±00.16)	1,334,092	23.6 (±00.07)

^a Excludes codes A, M, S, 2, 3, 4, 5, 6, 9 and missing (N = 7,280). ^b Excludes old Code 2 for diploma graduate (N = 3,799).

** Numbers in parentheses refer to the 95% confidence interval of the attrition rate.

--Because of the confusion between PROMIS and MEPRS codes, entries were reclassified appropriately as 2 years or more of college.

The continued proliferation of credentials and other nuances must be considered when adjusting tier categorization. In addition to distinguishing between types of "Some College," GED and Home School credentialing remain problematic. It seems that alternative education groups such as these have *adapted* to the credential screening system for enlistment by trying to make their credentials indistinguishable from those issued to traditional high school graduates. For example, by obtaining a local high school diploma that is either issued directly to such students or issued after completing the last year or semester at a public high school, individuals who spent the predominance of their time in a Home School Program cannot be distinguished from traditional high school diploma graduates.

Attrition and Sociodemographic Factors Other Than Education Credential

Despite the EBIS-based revision of the tier system and the high proportion of Tier 1 recruits, there has been concern that attrition has not declined appreciable. Aside from an attrition "floor" effect introduced by consistently high percentages of high school diploma graduates, it is also important to consider characteristics other than education credential that are also related to attrition and thus may be obscuring the true education-attrition relationship. Additional analyses were undertaken to examine trends in early separation in order to shed light on this issue. The 1988-1992 cohorts were used for this purpose. This period encompasses the onset and height of the drawdown, and includes the most recent accession year for which meaningful data on early separations can be obtained.

Figures 1 through 4 set the background for this discussion and present attrition rates by Service and cohort together with the accession percentages for alternate credential holders, including occupational program graduates, home and correspondence school completers, GEDs, attendance/completion credential holders, and non-high school graduates. The rate of overall attrition is relatively stable over time, regardless of the percentage of Tier 2 (and 3) accessions within a given cohort. For instance, over this period, Army Tier 2 accessions reached a peak in 1989 of nearly 10 percent of that cohort. However, the attrition rate was only slightly higher than it was in 1988 and slightly lower than in 1990, 1991, and 1992 when the percentage of Tier 2 and 3 accessions ranged from 2 to 7 percent. The rate of attrition did not necessarily increase with an increase in the percentage of Tier 2 and 3 accessions. These data suggest that other factors in addition to the percentage of alternate credential holders are involved in determining the rate of attrition, and that such factors must be varying over time.

Figure 1
Army Tier 2 and 3 Accessions and 36 Month Attrition, 1988-1992

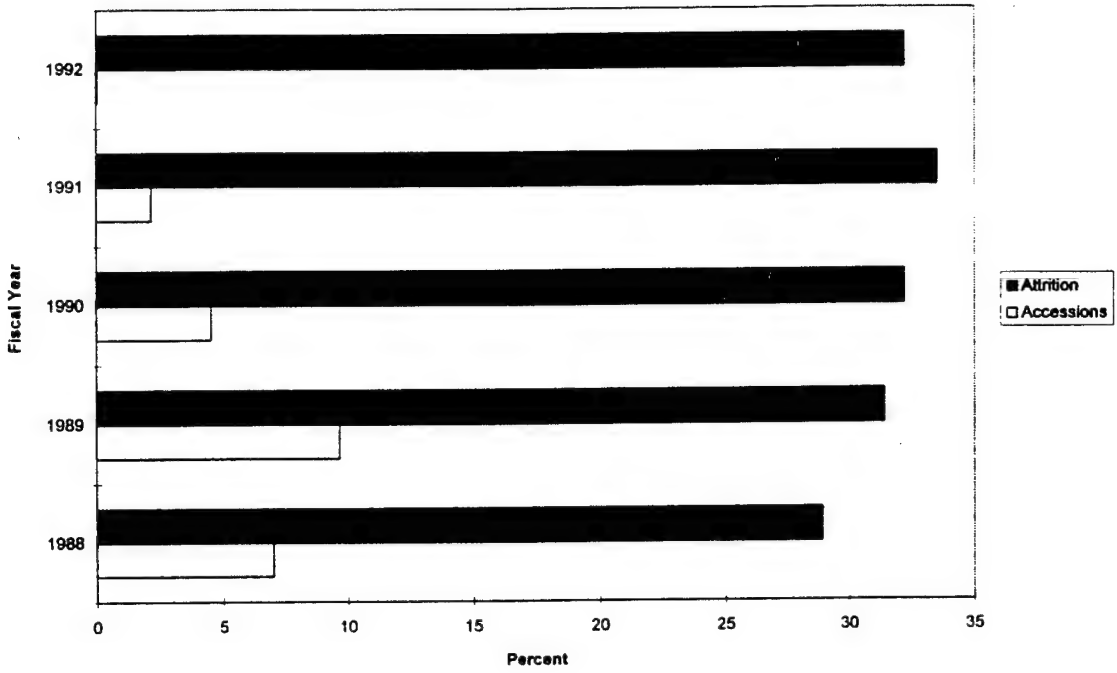


Figure 2
Navy Tier 2 and 3 Accessions and Attrition, 1988-1992

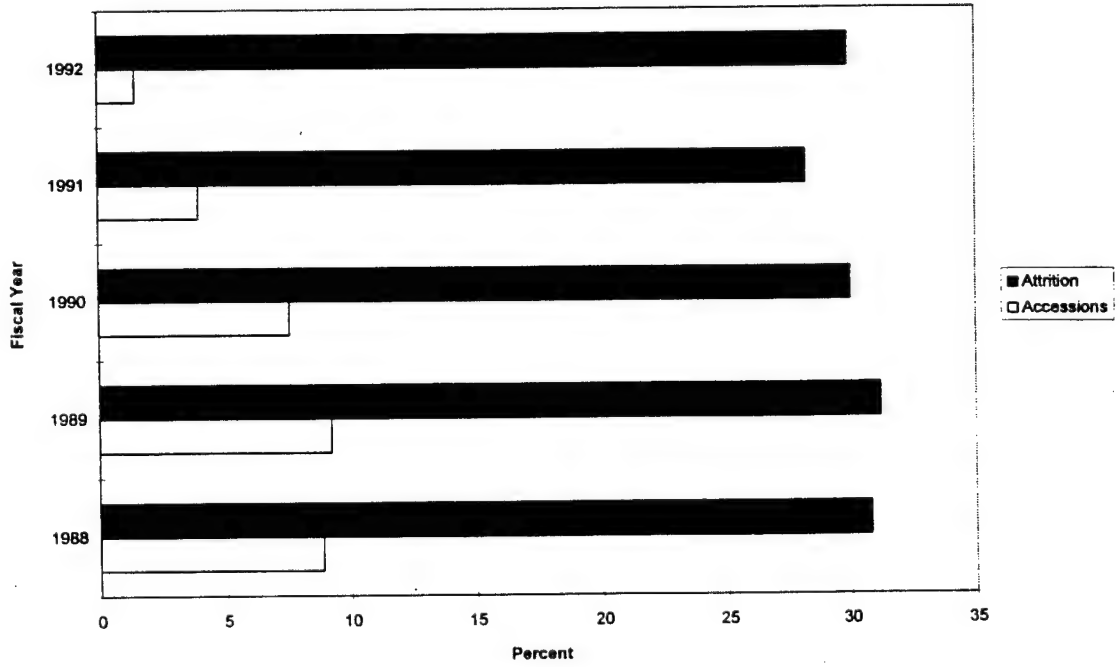


Figure 3
Marine Corps Tier 2 and 3 Accessions and Attrition, 1988-1992

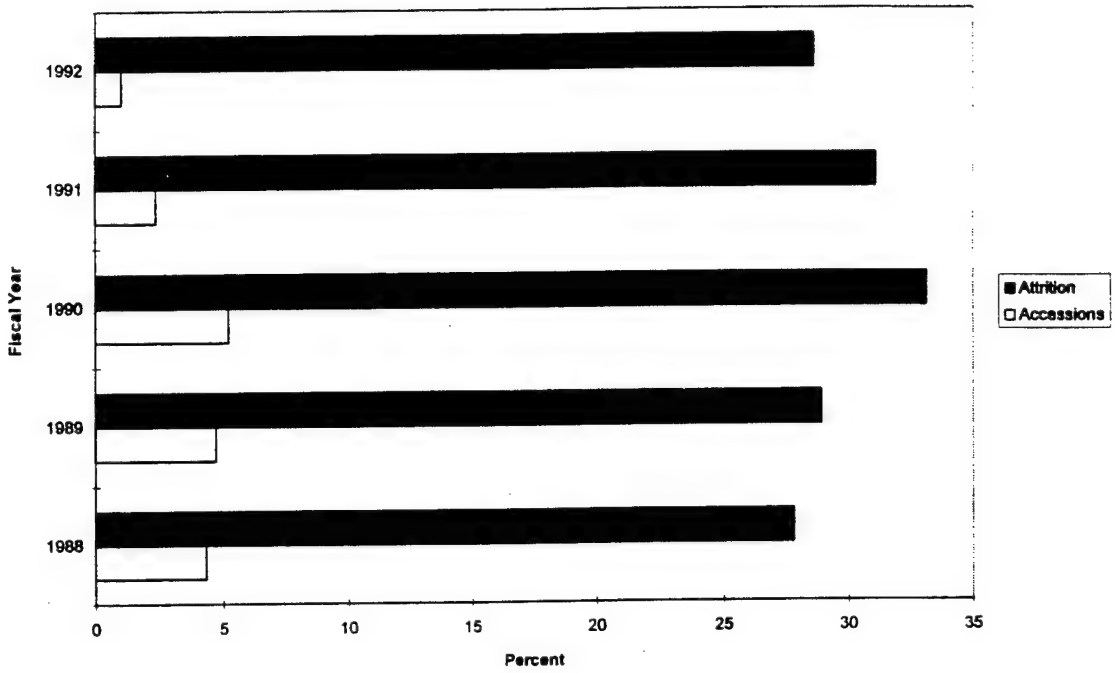
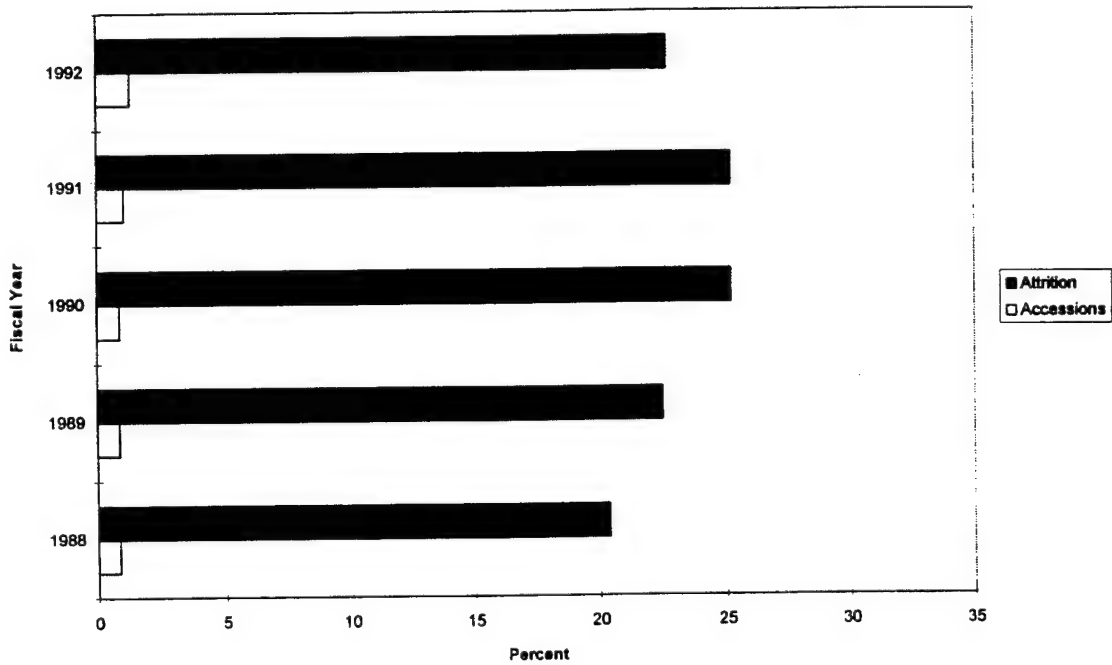


Figure 4
Air Force Tier 2 and 3 Accessions and Attrition, 1988-1992



There are a variety of reasons why someone may separate from the military before their term of enlistment has expired. The most frequently encountered include unsuitability on behavioral (e.g., motivational problems, drugs, financial irresponsibility, homosexuality) and medical (e.g., disability, failure to meet weight/body fat standards) grounds. Figures 5 and 6 show the percentage of all attrition that fell into each of these categories by Service and cohort.

Figure 5
Percent Attrition Characterized as Behavioral by Service and Cohort

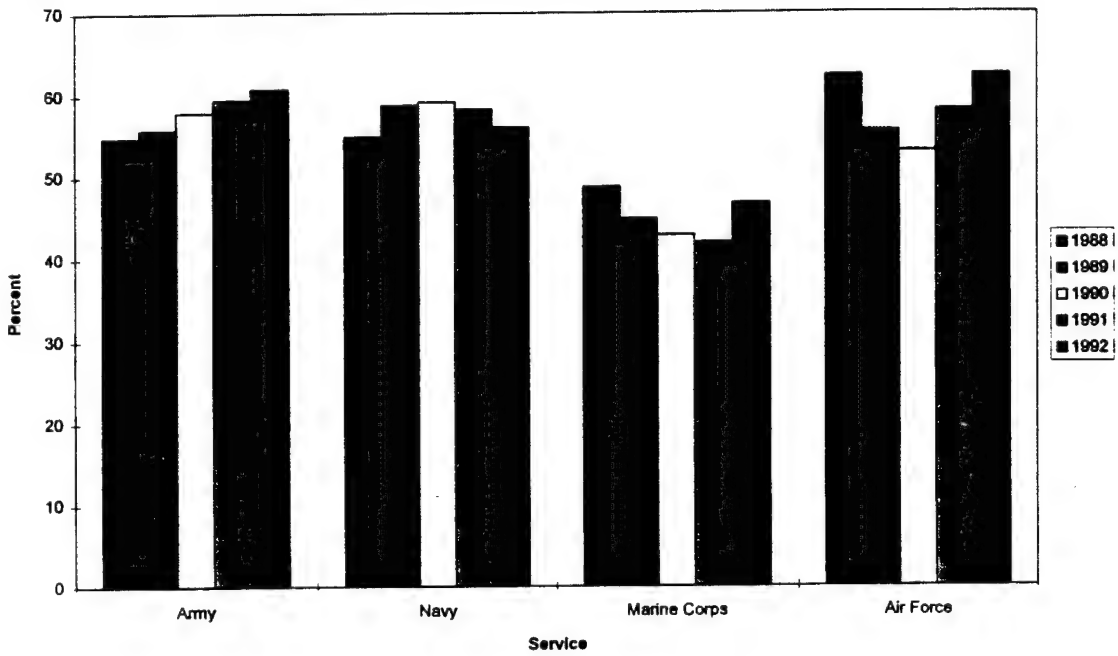
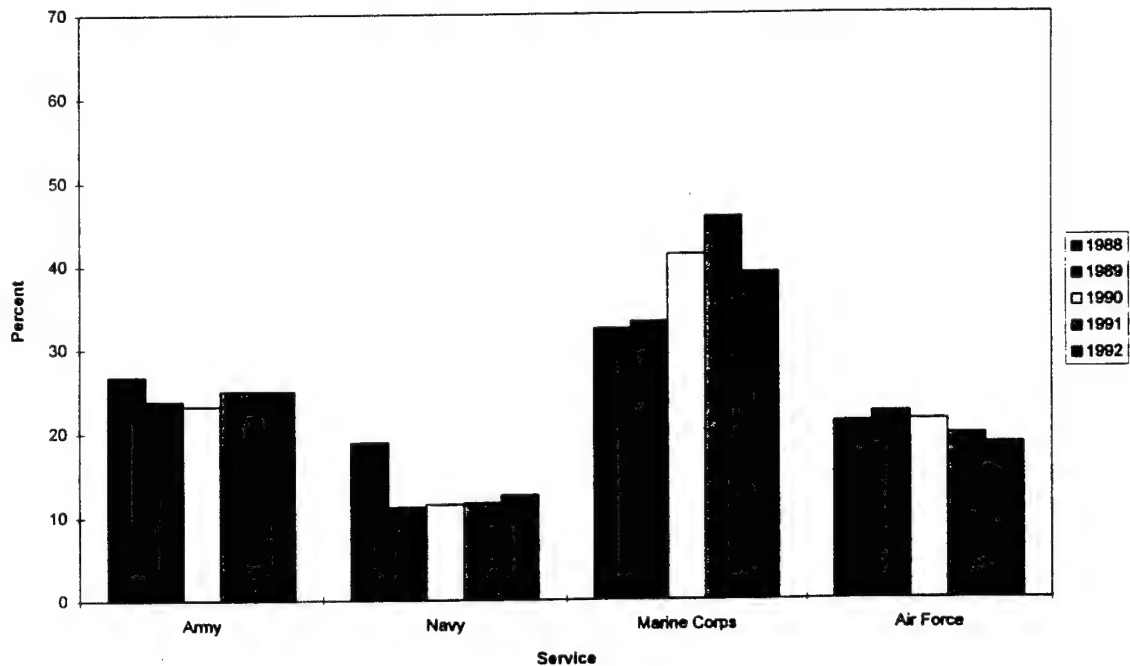


Figure 6
Percent Attrition Characterized as Medical by Service and Cohort



As seen in Figures 5 and 6, attrition for behavioral reasons was more common than for medical. Only in the Marine Corps did the two categories approach similar levels, as early separation for medical reasons was more common than in the other branches. Correspondingly, behavioral attrition was lowest in the Marine Corps, with the other Services closely bunched in the 50-60 percent range. Finally, these figures remained fairly stable over time. It may be noteworthy that the largest variations occurred in the Marine Corps, where separations for behavioral reasons dipped from 1988 through 1991 at the same time that medical attrition rates increased. This may reflect a tendency to maintain a steady level of attrition; as rates drop for one set of causes, they increase in other areas to *compensate*.

To develop a better understanding of the factors underlying attrition, multivariate analyses were conducted to account for a range of variables that have been shown to be related to this outcome. As discussed previously, the relationship between education credential and early separation has been demonstrated repeatedly, with traditional high school diploma holders experiencing lower rates of adverse attrition than those who fail to complete their secondary education and those who have alternative degrees. Although this relationship may be the most documented, other personal and background characteristics have also been shown to be associated with higher probabilities of failing to complete an initial term of service. Among these are aptitude as measured by the Armed Forces Qualification Test (AFQT), gender, age, race, marital status, number of dependents, and receipt of a moral waiver for admission (Laurence, Naughton, & Harris,

1995). The use of a multivariate approach allows for the examination of these variables in combination, while taking into account the fact that they are also related to one another.

To explore the differences between those who leave service prematurely and those who remain, a sequential model was developed based on three sets of variables; education credential, personal characteristics, and service-related factors. The variables included in the models were:

Educational Credential Group

Tier 2A = Correspondence School, Occupational Program, GED, Home School, Certificate of Attendance Completion, Nongraduate (Comparison Group = HS Graduate, 1 semester college, adult education diploma, college)

Tier 2B² = Tier 2A plus 1 semester college, adult education diploma (Comparison Group = HS Graduate, college)

Personal Characteristics

Gender
Race/Ethnicity
Aptitude Category
Marital Status
Number of Dependents
Body Mass
Age
Waiver

Service-Related Characteristics

Branch of Service (separate models by Service)³
Accession Cohort

The sequential approach first involved relating education credential to whether individuals departed service prior to completing 36 months.⁴ Personal characteristics were added in the next iteration, followed by military-related variables. The goal was to identify successive models that showed an increased correlation between the predicted and observed values of the dependent measure (attrition). The greater this correlation, the better the model was at explaining attrition. Because of the large number of observations

² This was done because attrition patterns for these "tier 1" credentials are actually more similar to the tier 2 rates.

³ In light of credential coding confounds and because attrition rates vary appreciably by Service, separate models were estimated.

⁴ Those with terms of enlistment of less than three years were eliminated from the database prior to conducting these analyses. This amounted to some 62,000 cases, or 4.1% of the population. The three year point is standard for DoD attrition analyses. A 24-month criterion was used for earlier analyses by specific credentials to increase the number of cohorts and thus facilitate more stable attrition estimates particularly for less populous credentials.

in the population, even a small increase in the correlation may be statistically significant, although the practical importance of this increase may be questionable.⁵

Logistic regressions were run twice. In one case, credential was entered as the first explanatory variable, followed by demographics and military experience variables. The analyses were then rerun with demographics entered first, followed by military experience and education credential. This allowed us to explore the differential contribution of the variable(s). The tables in Appendix B, present the results of the analyses.⁶ They are summarized graphically in Figures 7 through 9 for Tier 2.⁷ These figures show the odds of attrition for each of the groups seen on the x-axis in relation to their comparison group. For instance, the results displayed in Figure 7 indicate that the odds of men separating from the Army prematurely were 55 percent less than they were for women, and that this difference was slightly greater when education was taken into account (59 percent). The other comparison groups are: Black/Hispanic/Other ethnic/racial group compared to Whites; AFQT Categories I&II, IIIB, and IV compared to IIIA; married compared to unmarried servicemembers; those with compared to those without dependents; those who required a waiver to enter service compared to those who did not; and the 1988, 1989, 1991, and 1992 cohorts compared to 1990. For the continuous variables of bodymass (weight in kilograms/height² in meters)⁸ and age, the figures show an increase/decrease in the odds of attrition per unit change in the variable. Thus, Figure 7 shows that for every unit increase in bodymass the relative odds of attrition increase approximately 5 percent.

Across Services, other than credential, the variables that appear to have the most significant impact are as follows:

- *Possession of a waiver to enter service.* These are largely instances where individuals have been convicted of misdemeanors or other minor offenses that require review before that person can enlist. Despite the fact that the behaviors in question are generally minor, someone who obtained a waiver was 10 to 30 percent more likely to separate prematurely than those who did not need this form of clearance.

⁵ To assess the statistical significance of the increment in the model fit (i.e., the increase in correspondence between the observed and the predicted values of the dependent variable), the Chi Square statistic is calculated as the difference between $2 \times$ (minus log likelihood) in the two models in question; the degrees of freedom equals the number of additional variables in the added model.

⁶ The Marine Corps was excluded because preliminary attempts at logistic regression analyses failed to find a stable solution after 25 iterations most likely due to problems with multicollinearity between bodymass and gender.

⁷ Figures 6 through 8 display the results achieved with credentials categorized as follows: Tier 2A includes correspondence school diploma, occupational program graduate, GED holder, home school attendee, holders of certificates of attendance/completion, and non-high school graduates (Tier 3). These were compared to regular high school degree graduates, adult education diplomas, and those with one or more semesters of college.

⁸ See Laurence, M.T. (1985, August). *Proposals for the revision of AR 40-501: Height and weight standards for enlistment.* Arlington, VA: Defense Manpower Data Center.

- *AFQT category.* As might be expected, those in the below-average aptitude groups (IIIB and IV) were more likely to leave service early than were Category IIAs, whereas above average individuals were less likely to separate prematurely. In the Air Force, this pattern did not hold for Category IVs, although the number of cases in this instance was very small and the results were not significant.
- *Minority status.* In all Services, minority members were less likely to leave early, with relative odds ranging from 10 percent less for Blacks in the Navy to 50 percent less for “other” minorities in the Navy.
- *Gender.* Finally, men were less likely to separate prematurely, with the relative odds compared to women ranging from 17 percent in the Navy to 55 percent in the Army.

Figures 7 through 9 show the impact of education credential in relation to the other variables. As mentioned, each regression was run twice, with credential added as the first element in the model and as the last. By comparing the full model with (model 3 in Appendix B) and without education (model 5 in Appendix B), some insight into how educational background mediates other characteristics related to attrition can be ascertained.⁹

The largest difference between the models with and without education involved AFQT category, particularly for those of below average aptitude. In both the Army and the Navy, when education was included in the model, the relative odds of attrition were substantially higher for Category IIIBs and IVs as compared to Category IIAs than when it was not included. This reflects the fact that applicants scoring in the below-average range on the AFQT must have compensatory attributes before being allowed to enlist. Chief among these is a high school diploma or post-secondary credit. This can be seen in Figure 10. Among 1988-1994 accessions, 94 percent of Category IIIBs and 96 percent of Category IVs were regular high school graduates. These figures were 89 percent and 88 percent amongst Category I/IIIs and IIAs. Further, while less than 1 percent of the below average AFQT group held GEDs, nearly 3 percent of Category I/IIIs and just over 5 percent of IIAs had obtained this alternate credential.

Thus, the relative odds of a lower aptitude individual leaving service prematurely do not appear to be that much greater than those of average aptitude when education is left out of the equation because the lower ability group has educational “advantages.” When these differences are taken into consideration, however, the true impact of aptitude on attrition comes to the fore. This analysis indicates that using education credential as a compensatory factor in evaluating the suitability of lower aptitude applicants is an effective practice. At the same time, even with equal or superior educational credentials, the “staying power” of Category IIIBs and IVs will still not equal that of average or above-average recruits.

⁹ Note that over the period in question, the Air Force accessed very few Tier 2 candidates. Thus the impact of including this dimension in the regressions was negated.

Figure 7--Relative Odds of Attrition With and Without Education in Model Army Tier 2A

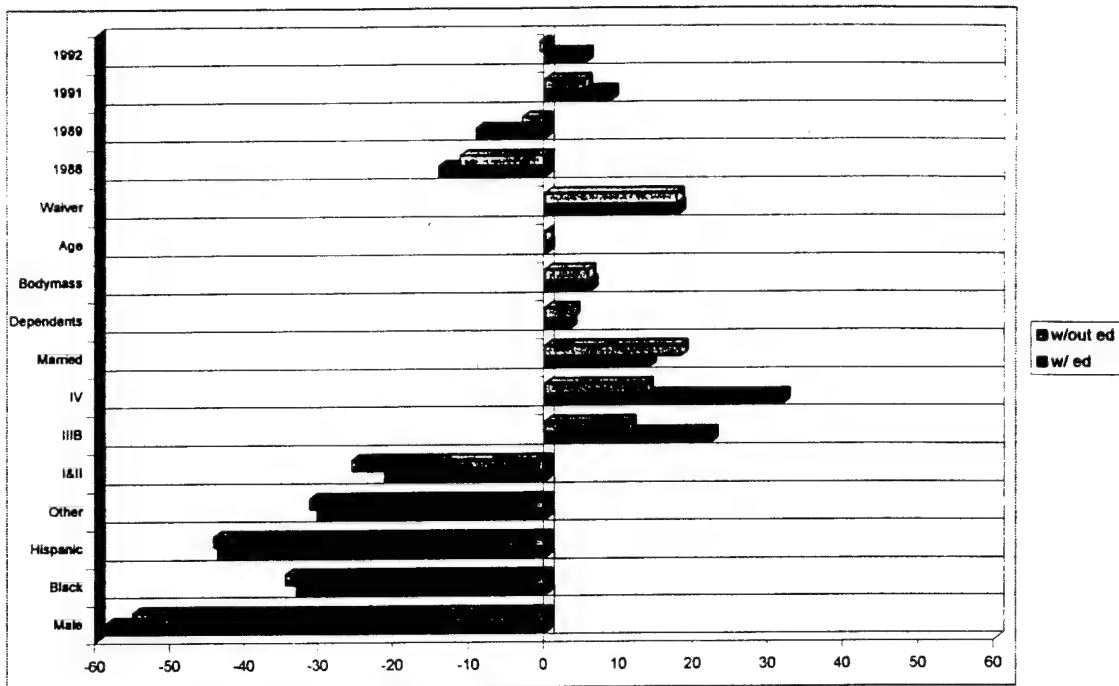
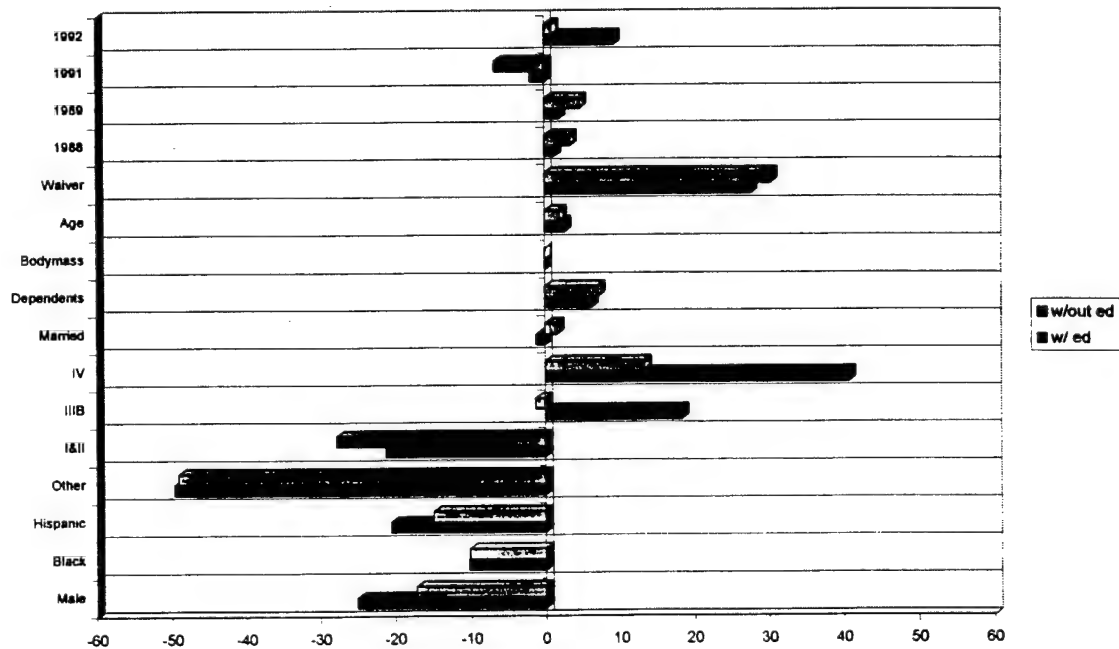
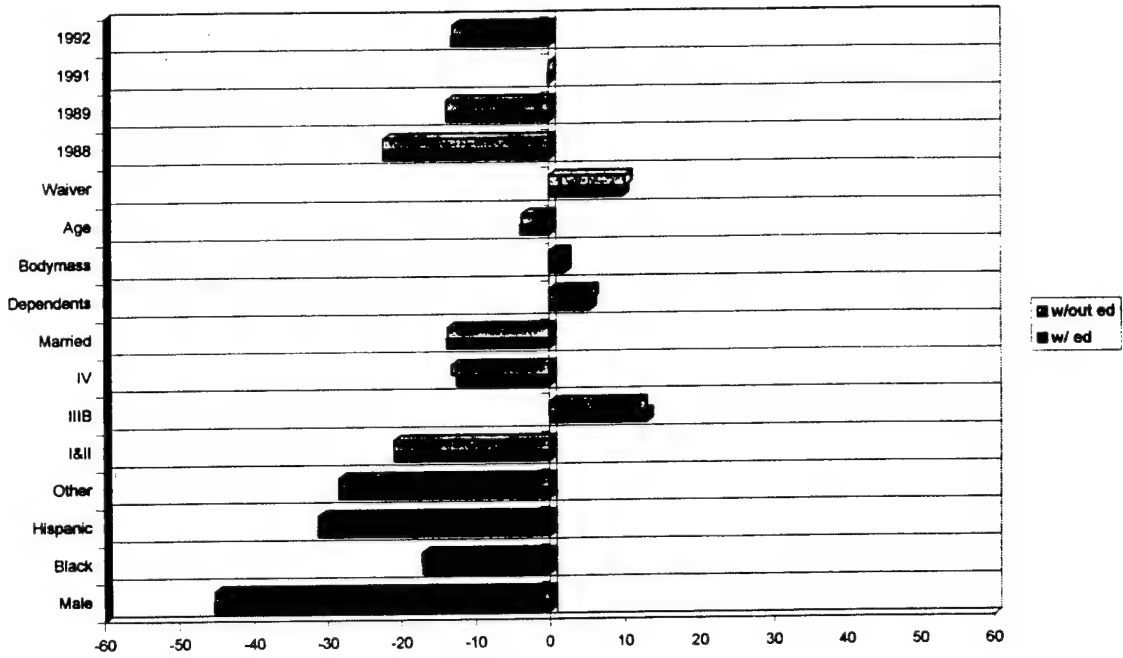


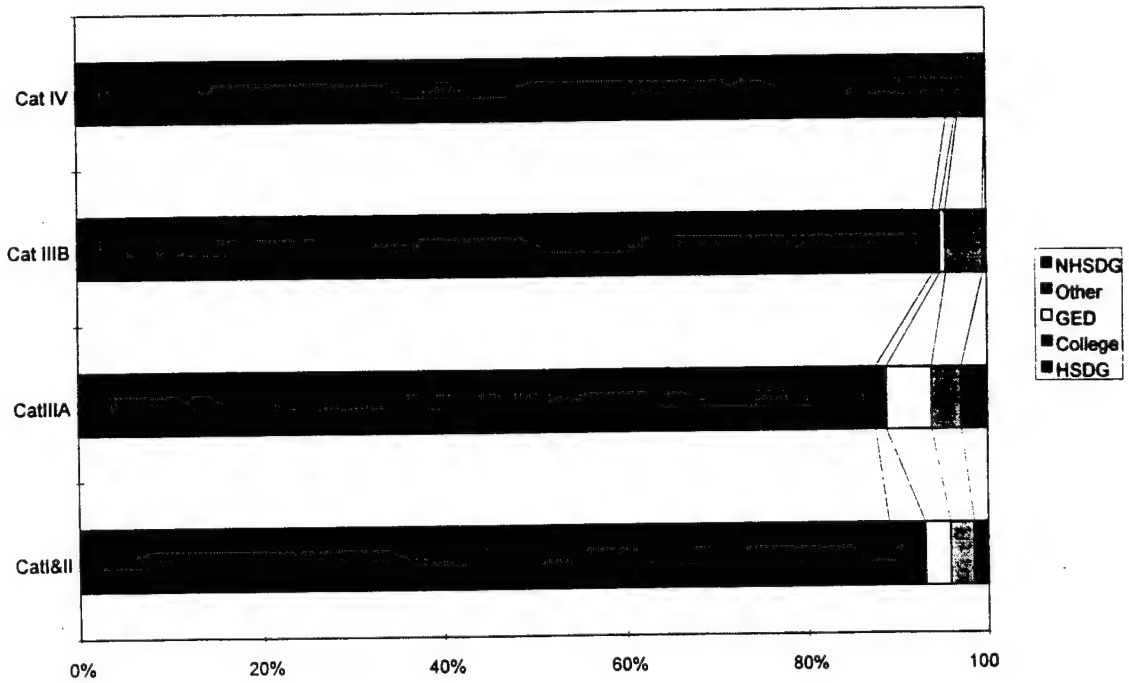
Figure 8--Relative Odds of Attrition With and Without Education in Model Navy, Tier 2A



**Figure 9—Relative Odds of Attrition With and Without Education in Model
Air Force Tier 2A**



**Figure 10
Education Credential by AFQT Category, 1988-1994 Cohorts**

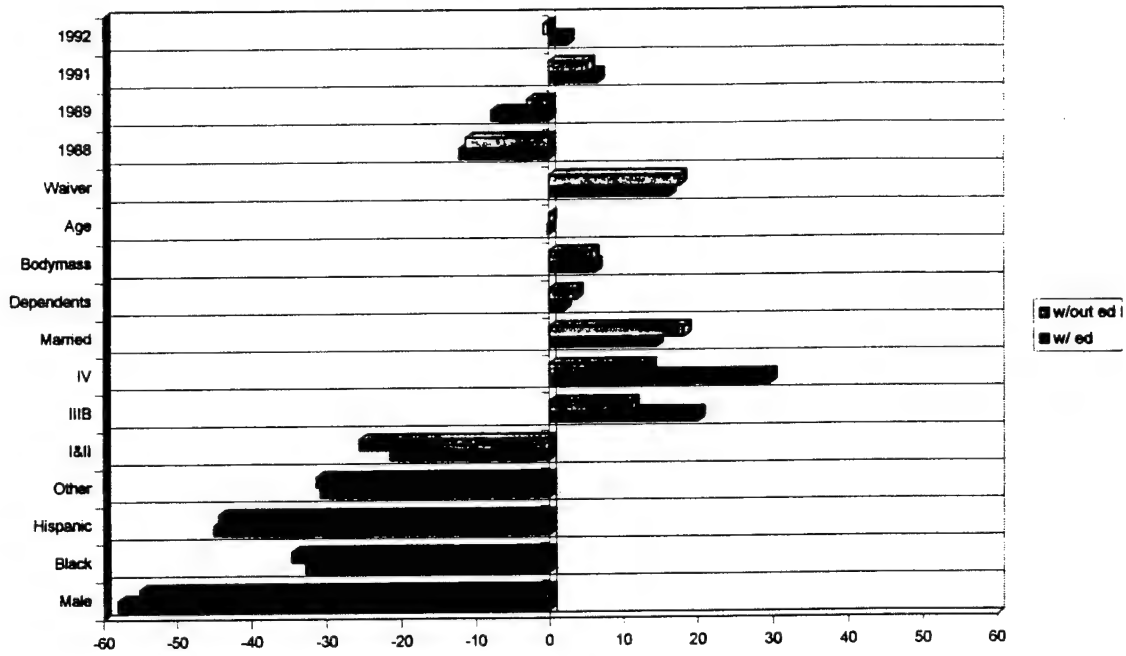


The analyses revealed several differences between accession years when education was and was not included in the model. For instance, in both the Army and Navy, the relative odds of a 1992 accession leaving service prematurely were 5 and 9 percent higher, respectively, as compared to someone who entered in 1990 when education was taken into account. These differences generally disappeared when credential was not included. Given the fact that the other variables in the model were being accounted for in these analyses, it appears that some characteristic of 1992 accessions or, more likely, policies and procedures in that year as compared to 1990, led to a higher relative probability of attrition among this cohort. It was also the case, however, that in 1992, less than one half of one percent of the Army's accessions were in Tier 2, as compared to 4.5 percent in 1990. Similarly, only 1.5 percent of the Navy's 1992 accessions were in Tier 2, as compared to 7.6 percent in 1990. Thus, the differences in odds of attrition between the two cohorts are masked by the superior education credentials of those who entered in 1992, only emerging when the impact of education credential is held constant.

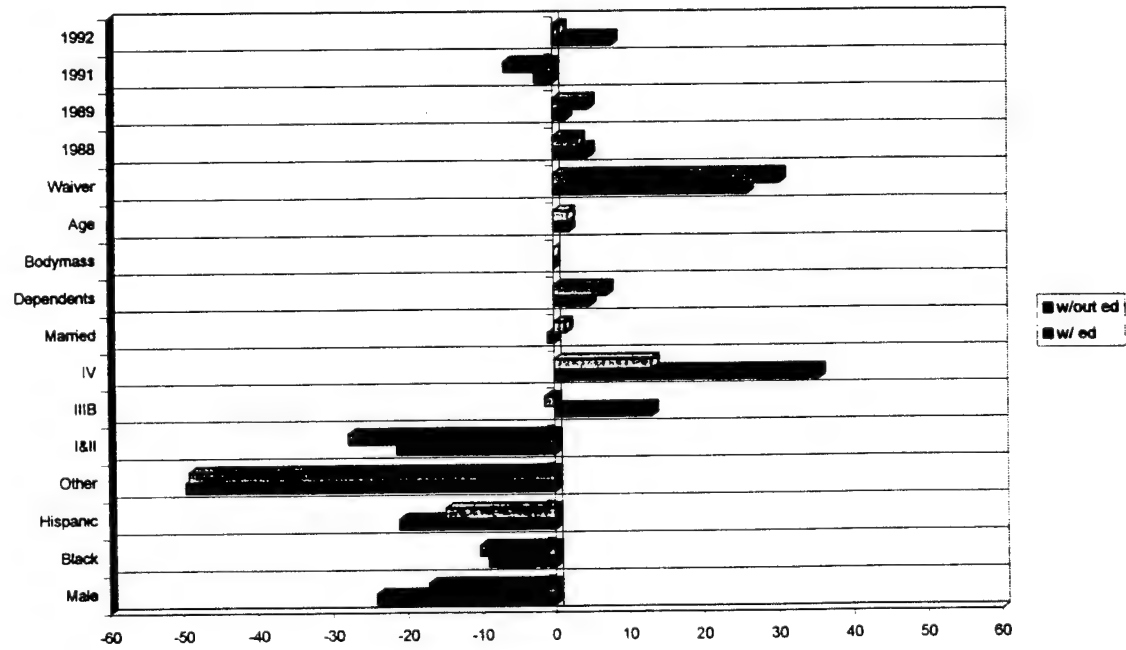
There are several other instances where the impact of education credential can be seen in Figures 7 through 9. For instance, the relative odds of women leaving service prematurely were somewhat higher in both the Army and Navy when education was included in the models. Again, this undoubtedly reflects the fact that, because they accept fewer women, the Services can be more selective in who they take in, setting higher goals for educational attainment among this group. When this factor is not taken into account in modeling attrition, there is less difference between the relative odds of attrition among men and women because of the "better" credentials of the latter group.

As mentioned previously, contrary to the outcomes of the Educational and Biographical Information Survey (EBIS) effort, adult education holders and non-high school graduates with some college experience were placed in Tier 1 rather than Tier 2 as the EBIS results suggested. As a test of the propriety of the inclusion of these particular groups in Tier 1, the logistic regressions were repeated with these individuals included in the "analytic" rather than the comparison group in contrast to the analyses presented above. These results are presented in Appendix B, and summarized in Figures 11 through 13.

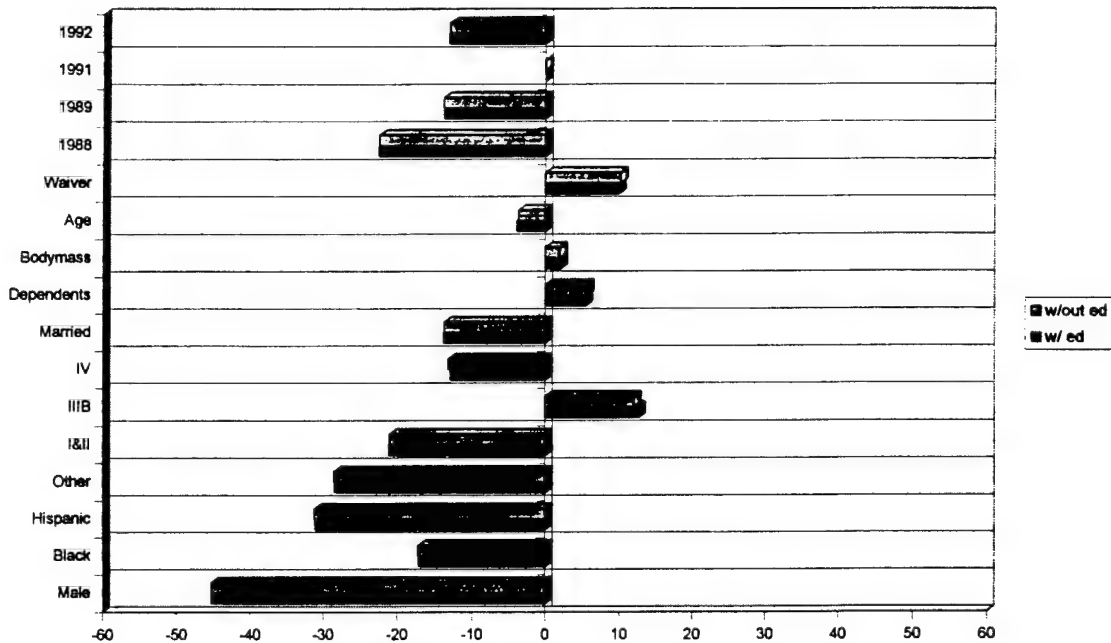
**Figure 11—Relative Odds of Attrition With and Without Education in Model
Army Tier 2B**



**Figure 12—Relative Odds of Attrition With and Without Education in Model
Navy Tier 2B**



**Figure 13—Relative Odds of Attrition With and Without Education in Model
Air Force Tier 2B**



As indicated by the Tables in Appendix B, the relative odds of attrition for the analytic group (Tier 2) drop slightly when it includes adult education diploma holders and nongraduates with one semester or more of college. That is, the odds of attrition from the Army for alternative credential holders are 136 percent greater than the comparison group that included adult education/one semester college individuals along with regular high school diploma graduates and college attendees. This figure dropped to 122 percent when the adult education group was added to Tier 2. Similar results occur in both the Navy and Air Force, where the inclusion of adult education credential holders and nongraduates with one semester of college decreased the odds of Tier 2 attrition 11 percent and 38 percent, respectively. The flip side of this result, of course, is that the inclusion of these individuals in Tier 1 increases the relative odds of attrition.

The results shown in Figures 11 through 13 indicate that the impact of switching adult education and nongraduate college attendees from Tier 1 to Tier 2 is negligible. In part, this is likely a function of the small numbers of individuals involved. The only notable exception to this conclusion is in the Navy, where the relative odds of attrition for Category IIIBs are 13 percent higher when adult education and non-graduate college attendees are included in Tier 2, and 18 percent higher when they are included in Tier 1. A similar outcome can be seen for Category IVs in the Navy. This mirrors the overall results of this classification difference just described.

Alternative Attrition Screening¹⁰

Screening on the basis of education credentials has been an effective and efficient means of attenuating attrition. However, DoD and the Services have researched other selection measures, most notably, biographical and temperament inventories. One particular biographical questionnaire, known as the Armed Services Applicant Profile (ASAP),¹¹ was the most recent attrition screening alternative evaluated with regard to its potential to supplement or supplant the education credential tier system. Regardless of the *apparent* power of biodata, technical, practical, and political concerns precluded its operational adoption. Among the nullifying issues was concern about the realistic potential for recruiter coaching and applicant faking of a self-report biodata inventory.

Although biodata was never operationally implemented, the Navy has tested a Compensatory Screening Model (CSM) that excluded ASAP. The trial CSM was implemented in July 1992 and included factual background information rather than a self-administered, self-report biographical inventory. The Navy CSM was applied only to Tier 2 and 3 applicants in the upper half of the AFQT distribution (Categories I to IIIA).¹² More specifically, the Navy trial CSM considered a prospective recruit's aptitude score, employment status, years of education completed, age at enlistment, participation in a youth military program (e.g., Junior ROTC), and criminal record in addition to the particular credential within Tier 2 or 3 in an attempt to compensate for the attrition risk associated with individuals with alternative credentials. Up to five percent of Navy enlisted accessions were authorized to be drawn from CSM-screened applicants.

In September 1994, the Navy implemented a revised CSM for operational use. The current CSM computes an eligibility score from Tier 2 or 3 applicants' AFQT score, age, years of education, and education credential. In addition, a less stringent CSM cut score qualifies military youth program participants and applicants who pass a recruiting district commander's interview. FY 1995 operational results show an increase in the proportion of GED holders within Tier 2 and 3 accessions of 8 percentage points above the pre-CSM period (FYs 1988-1991).¹³ CSM-screened recruits have higher aptitude and educational attainment and attrition has been reduced slightly. The Navy reports a 4 percentage point drop in 24-month attrition among the CSM-screened accessions in comparison to a 1993 control group of non-screened Tier 2 and 3 upper aptitude level personnel. Though the overall impact on attrition is small, the Navy plans to maintain the CSM program as a means of improving personnel quality and filling understaffed occupations with average or above aptitude sailors.

¹⁰ For a detailed discussion of attrition screening see: Trent, T., & Laurence, J.H. (1993). *Adaptability screening for the Armed Forces*, Washington, DC: Office of the Assistant Secretary of Defense (Force Management and Personnel).

¹¹ ASAP was administered from December 1984 through February 1985 to a sample of over 120,000 military applicants.

¹² Persons scoring at or above the 50th percentile on the Armed Forces Qualification Test (AFQT); also termed AFQT Categories I-III A.

¹³ Thomas Trent, Navy Personnel Research and Development Center, San Diego, CA (personal communication, 1996).

The Department of Defense has conducted CSM research using Service-specific and Joint Service or DoD-wide models. The other Services have elected not to implement a CSM at this time given its projected limited viability and utility. The Army, however, continues to investigate the CSM concept (with improvements) for potential use with high school graduate as well as with non-graduate applicants. It should be noted that many of the variables used in the above multivariate models have been deemed inappropriate for CSM use. Demographic factors such as gender and race, although related to attrition, are difficult to justify on the basis of fair selection practices. Years of education is a potentially useful predictor in addition to education credential, however, it too suffers from coding unreliability. According to Service representatives, it is often the case that this entry on the enlistment processing form (DD 1966) is missing or in error. Years of education are often surmised from the credential. This issue is especially relevant with regard to accelerated and overseas high school programs.

Recommendations

Credential Coding. While some coding error is to be expected in an operational system, the current systematic coding inaccuracies must be corrected. With regard to the tier system, it would be best if all Services adopted the MEPRS codes. If Service-common codes are not adopted, alternate steps must be taken to ensure accurate coding. The least promising "fix" would be for the Services to simply be more vigilant and instruct recruiters in the use of MEPRS codes. Personnel changeover limits the effectiveness of this tactic.

It would be wise to evaluate all existing codes (MEPRS included) regarding education and to ensure that there are no overlapping codes representing divergent credentials as currently is the case between MEPRS and PROMIS. If MEPRS codes are inadequate for use by all Services, then the MEPRS codes should be modified to correct identifiable deficiencies. A revamping of MEPRS codes, if warranted, should include more intuitively appealing codes rather than the alpha numeric combination with no consistent relationship to the credential.

Separate codes for academic and vocational programs within the Some College category should be devised. (Appendix A provides suggested coding definition changes as offered by Navy Recruiting Command headquarters and regional education specialists.) Along these lines, the Services must remain attentive to the continued proliferation of credentials and gaming of the system. The Navy has been particularly vigilant as its education specialists routinely canvass schools in their respective recruiting areas to verify the legitimacy of issued credentials. A more formal mechanism of sharing such information among Services should be implemented.

Tier Placement. On the basis of attrition trends to date, adult education and one semester of college credentials appear out of place within Tier 1 and more in line with

Tier 2 rates of attrition. Placement within Tier 2 should be considered for these credentials. GED holders, on the other hand appear to be appropriately placed within Tier 2. In fact, the attrition rate for GED holders tends to be relatively high when contrasted with other Tier 2 credential categories.

Alternative Credential Screening. Based on the Navy's experience, a CSM applied to Tiers 2 and 3 is not expected to reduce attrition appreciably. Its use within Tier 1 has been avoided most likely because this would adversely affect recruitment supply. Quality has become synonymous with aptitude levels and the proportion of high school diploma graduates among incoming recruits. It would be difficult to eliminate reliance on such shorthand quality statistics used to assess recruiting success.

Further Research. Given the increasingly vocal Home School contingent, and the conflicting and unreliable results-to-date regarding their tier placement, efforts should be directed at identifying distinguishing characteristics of such graduates. Navy waiver interviews could be emulated for use with such applicants. That is, a data collection/impressions sheet could be devised for recording pertinent characteristics of Home School applicants. That is, potentially relevant traits, behaviors, and characteristics could be posited and this information could be collected during the enlistment process. When sufficient Home Schoolers have enlisted, the information would be content analyzed and characteristics related to attrition for potential ultimate CSM-type screening.

Another relatively small research investment would be to develop a model from the multivariate analyses results to predict attrition based on credential together with other accession characteristics. This would allow DoD to gauge and report on the effect of education credential screening in the face of other accession patterns such as an increasing proportion of women.

More intensive efforts should be directed at determining the behavioral triggers of attrition. A policy capturing study could be designed and conducted with the ultimate aim of ensuring that attrition is more criterion referenced in contrast to the apparent norm referenced basis that exists now (Laurence, Naughton, Harris, 1995). In addition to getting management's perspective, the attritee's perspective might also be valuable. Toward this end, the feasibility of collecting attrition relevant information through exit surveys such as those now fielded by the Army and Navy should be considered. Similarly, the Youth Attitude Tracking Study (YATS) data should be mined for relationships with subsequent attrition.

Concluding Note. Attrition reduction is but one facet of the selection and classification system for the Military Services. Maximizing job proficiency, increasing readiness, and reducing turbulence are also considerations. Furthermore, the Services must strive to meet these goals in a cost effective manner, and it is in this light that DoD assessed the current education credential tier system. Unfortunately, this vantage point at times may be in conflict with the individual applicant's perspective. That is, many

individuals will be denied entry into service because of group characteristics (i.e., education credential). As a selection approach to the problem of attrition, education credential screening is effective from an organizational perspective. However, whereas credential tier is the best single predictor, other personal characteristics are also associated with early separation. Furthermore, although the rate of attrition is lower for high school diploma graduates and others within Tier 1, as the most numerous group enlisted, more actual attrition cases fall within this group. For these and other related reasons such as tier degradation and coding unreliability, as the percentage of Tier 1 recruits increases, attrition will not decline appreciably. It is important to gain a better understanding of the phenomenon of attrition not only from the personnel selection perspective but also from the organizational vantage point. Attrition still will not go away, but it may be better understood and controlled.

References

- Cheatham, C.W. (1978). *The high school graduate, an indicator of a quality Marine?* Fort Levenworth, KS: U.S. Army Command and General Staff College.
- Department of Defense. (1981). *Implementation of new Armed Services Vocational Aptitude Battery and actions to improve the enlistment standards process*. Report to the House and Senate Committees on Armed Services. Washington, DC: Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics).
- Flyer, E.S. (1963). *Prediction of unsuitability among first-term airmen from aptitude indexes, high school reference data, and basic training evaluations* (PRL-TDR-63-17). Lackland Air Force Base, TX: Personnel Research Division, Air Force Human Resources Laboratory.
- Hand, H.H., Griffith, R.W., & Mobley, W.H. (1977). *Military enlistment, reenlistment and withdrawal research: A critical review of the literature* (TR-3). Arlington, VA: Office of Naval Research.
- Laurence, J. H. (1984). *Education standards for military enlistment and the search for successful recruits* (FR-PRD-84-4). Alexandria, VA: Human Resources Research Organization.
- Laurence, J. H. (1987). *Military enlistment policy and education credentials: Evaluation and improvement* (FR-PRD-87-33). Alexandria, VA: Human Resources Research Organization.
- Laurence, J.H., Naughton, J.A., & Harris, D.A. (1995). *Attrition revisited: Identifying the problem and its solutions* (FR-PRD-95-1). Alexandria, VA: Human Resources Research Organization.
- Smith, J.V., & Kendall, W.A. (1980). *Personal, situational, and organizational determinants of Navy enlisted attrition*. Unpublished master's thesis. Monterey, CA: Naval Postgraduate School.
- Trent, T., & Laurence, J.H. (1993). *Adaptability screening for the Armed Forces*. Washington, DC: Office of the Assistant Secretary of Defense (Force Management and Personnel).
- Walker, C. (in preparation). *Attrition and retention in UTP-3 nations*. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Appendix A
Proposed Education Verification Codes

CODE	TIER	CREDENTIAL/DEFINITION
L	1	<p>High School Diploma</p> <p>A diploma issued on the basis of attending and completing a 12-year or grade day program of classroom instruction. The diploma must be issued from the school at which the individual completed all the program requirements of the day program.</p>
B	1	<p>Adult Education Diploma</p> <p>A diploma awarded on the basis of attending and completing an adult secondary education or continuation program. An evaluation of credentials should include an assessment of credits received from all secondary day school programs attended and various types of classroom, self-paced, computer or competency-based and correspondence courses. The majority of credits completed during the adult program must be awarded as a result of the teacher-student classroom lecture technique of instruction. Adult secondary equivalency diploma programs do not qualify for inclusion in this category. Also, with this definition do not confuse the secondary vocational program that adults attend and are issued an "Adult Diploma or Certificate" (Code "C" - Occupational Program Certificate).</p>
8	1	<p>Completed one semester of college - Academic</p> <p>The status of an individual who is a non-high school graduate or alternate secondary credential holder, attended a traditional accredited postsecondary academic college or university, and completed at least 15 semester or 22 quarter hours of college-level credit. Credit earned through testing for pursuit of secondary equivalency is not applicable. Also, credits earned for remedial, parallel or developmental courses are considered to be institutional credits, not college-level credits, and cannot be included. These are known as preparatory courses for college and are usually zero hundred (000) level. (NOTE: Provide a DD 370 on each secondary school attended to verify grade level. An advanced assessment by the Education Specialist can eliminate potential problems.)</p>

CODE	TIER	CREDENTIAL/DEFINITION
V	1	<p>Completed one semester of college - Vocational</p> <p>The status of an individual who is a non-high school graduate or alternate secondary credential holder, attended an accredited postsecondary vocational institution, and completed at least 15 semester or 22 quarter hours of traditional college-level credit, or 675 clock hours of postsecondary vocational program credit. Credit or clock-hours received from secondary vocational training or from preparatory course work or testing for the pursuit of an equivalency diploma is not applicable. Also, credits or clock-hours received from post secondary remedial, parallel, or developmental courses will not be used. (NOTE: Some postsecondary vocational or technical programs refer to a semester as a 15 or 16 week time frame or a quarter as a 10 to 12 week time frame. They may, for example, record on the transcript 15 semester credit hours, however these 15 credits are not traditional college-level credit. This particular type of postsecondary credit equates to a certain number of clock-hours of instruction. The Education Specialist must ensure that these credits are either traditional semester or quarter hour credits or postsecondary clock-hours. An advanced assessment by the Education Specialist can eliminate potential problems.)</p>
D	1	<p>Associates Degree</p> <p>A postsecondary diploma awarded by an accredited institution following completion of two years of academic or vocational study.</p>
K	1	<p>Baccalaureate Degree</p> <p>A postsecondary diploma awarded by an accredited institution following completion of four/five years of academic study.</p>
M	1	<p>Applicants who are pursuing an accredited program that will yield High School Diploma Graduate (HSDG) status. This code is used to initially enlist applicants into the Delayed Entry Program. Prior to shipment of the enlistee to recruit training, this code will be changed to the appropriate code, either "B," "8," or "V."</p>

CODE	TIER	CREDENTIAL/DEFINITION
S	1	High school senior who is currently enrolled, intends to graduate and is enlisting in the DEP. Prior to shipment of the enlistee to recruit training, this code will be changed to the appropriate code - "L."
C	2	Occupational Program Certificate A certificate or diploma awarded for attending a non-correspondence secondary-level vocational, technical, or proprietary school for at least six months. An individual so coded must also have completed 11 years of regular day school. This is considered an alternate high school credential.
E	2	Test-Based Equivalency Diploma A diploma or certificate of General Educational Development (GED) or other test-based high school equivalency diploma. This includes state-wide testing programs such as the California High School Proficiency Examination (CHSPE), whereby examinees may earn a certificate of competency or proficiency. A state or locally issued secondary school diploma obtained solely on the basis of such equivalency testing is not to be considered a high school diploma.
H	2	Home School Diploma (Parents) Awarded by the parents of the applicant for completion of a program of 12 years of secondary education taught by the parents in their home.
T	2	Home School Diploma (Visiting Teacher) Awarded to the applicant for completion of a program of 12 years of secondary education taught in the home of the student by a visiting teacher.
J	2	High School Certificate of Attendance or Completion Awarded in lieu of a traditional high school diploma following a 12-year program of traditional secondary education. Those awarded the high school certificate of attendance usually failed to complete the requirements of the high school diploma, but successfully attended 12 years of instruction.

Appendix B
Logistic Regression Results by Service

Army--Tier 2A Credential/Demographics/Military Variables*			
-2 Log L	Difference	Degrees of Freedom	Significance
533098			
518541	-14557	12	***
517888	-652.82	4	***

Navy--Tier 2A Credential/Demographics/Military Variables			
-2 Log L	Difference	Degrees of Freedom	Significance
439939			
434827	-5111.9	12	***
434746	-81.1	4	***

Air Force--Tier 2A Credential/Demographics/Military Variables			
-2 Log L	Difference	Degrees of Freedom	Significance
1961530			
193056	-3097.2	12	***
192770	-285.5	4	***

Army--Tier 2B Credential/Demographics/Military Variables			
-2 Log L	Difference	Degrees of Freedom	Significance
532049			
517991	-14058	12	***
517566	-424.7	4	***

* Credential only is entered on the first step. This is then supplemented with demographics (e.g., age at enlistment, racial/ethnic background, gender, bodymass (weight/height), AFQT aptitude category, marital status, number of dependents, and whether a waiver was required for admission). The final step includes military variables, namely service and accession cohort.

Navy--Tier 2B Credential/Demographics/Military Variables			
-2 Log L	Difference	Degrees of Freedom	Significance
438421			
433904	-4517.4	12	***
433824	-79.56	4	***

Air Force--Tier 2B Credential/Demographics/Military Variables			
-2 Log L	Difference	Degrees of Freedom	Significance
196210			
193109	-3101.5	12	***
192821	-288.1	4	***

Army--Tier 2A Demographics/Military Variables/Credential*			
-2 Log L	Difference	Degrees of Freedom	Significance
523352			
523078	-273.29	12	***
517888	-5190.1	4	***

Navy--Tier 2A Demographics/Military Variables/Credential			
-2 Log L	Difference	Degrees of Freedom	Significance
440240			
440125	-115.36	12	***
434746	-5378.7	4	***

Air Force--Tier 2A Demographics/Military Variables/Credential			
-2 Log L	Difference	Degrees of Freedom	Significance
193210			
192925	-285.39	12	***
192770	-154.9	4	***

* Demographics, as described, entered first, followed by military variables and credential.

Army--Tier 2B Demographics/Military Variables/Credential			
-2 Log L	Difference	Degrees of Freedom	Significance
523352			
523078	-273.3	12	***
517566	-5512.2	4	***

Navy--Tier 2B Demographics/Military Variables/Credential			
-2 Log L	Difference	Degrees of Freedom	Significance
440240			
440125	-115.4	12	***
433824	-6300.9	4	***

Air Force--Tier 2B Demographics/Military Variables/Credential			
-2 Log L	Difference	Degrees of Freedom	Significance
193210			
192925	-285.3	12	***
192821	-103.9	4	***

**Relative Odds of 36 Month Attrition, Army
(Education Credential Tier 2A)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Attrition Rate = 31.4					
Education (HSDG+)					
Tier 2A (5.2)	135.7	171.0	187.2		
Gender (Female)					
Male (84.7%)		-58.6	-58.5	-55.3	-55.1
Race/Ethnicity (White)					
Black (23.1%)		-33.5	-33.1	-34.8	-34.6
Hispanic (6.0%)		-43.3	-43.8	-44.0	-44.3
Other (3.2%)		-30.2	-30.3	-31.2	-31.3
Aptitude Category (III A)					
I & II (42.3%)		-21.5	-21.2	-25.6	-25.6
IIIB (28.0%)		20.0	22.2	10.6	11.2
IV (3.5%)		23.9	31.8	11.2	13.6
Marital Status (Not Married)					
Married (12.3%)		9.0	14.0	13.8	18.2
Number of Dependents (\bar{x} = .2; sd = .6)		7.6	3.3	7.1	3.7
Body Mass (\bar{x} = 23.9; sd = 4.9)		6.3	6.1	5.9	5.8
Age (\bar{x} = 19.9; sd = 1.7)		0.3 (ns)	0.3 (ns)	0.1 (ns)	0.1 (ns)
Waiver (No Waiver) (91.2%)		18.7	17.9	18.3	17.7
Accession Cohort (FY90)					
FY88 (18.7%)			-14.1		-11.3
FY89 (19.2%)			-9.2		-3.0
FY91 (12.8%)			8.8		5.3
FY92 (13.0%)			5.4		-0.7 (ns)

Note: Tier 2A includes correspondence and occupational school graduates, GED and certificate of attendance/completion holders, home schoolers, and non-high school graduates. Comparison group includes regular high school graduates, adult education program graduates, non-high school graduates with one semester of college, and regular college attendees. Descriptive statistics (i.e., percentages or mean values) appear in parentheses beside the variable labels.

**Relative Odds of 36 Month Attrition, Navy
(Educational Credential Tier 2A)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Attrition Rate = 30.1					
Education (HSDG+)					
Tier 2A (6.6%)	154.4	186.5	188.8		
Gender (Female)					
Male (87.7%)		-25.3	-25.0	-17.6	-17.2
Race/Ethnicity (White)					
Black (18.7%)		-10.3	-10.3	-10.2	-10.3
Hispanic (8.7%)		-20.3	-20.5	-15.2	-14.9
Other (3.8%)		-49.5	-49.6	-49.3	-49.1
Aptitude Category (IIIA)					
I & II (41.4%)		-21.3	-21.2	-27.8	-27.8
IIIB (33.7%)		18.1	18.3	-1.3 (ns)	-1.3 (ns)
IV (6.9%)		39.7	40.7	16.0	13.3
Marital Status (Not Married)					
Married (5.2%)		-1.4 (ns)	-1.2 (ns)	2.8 (ns)	1.6 (ns)
Number of Dependents (\bar{x} = .1; sd = .4)		6.3	6.2	6.1	7.1
Body Mass (\bar{x} = 23.8; sd = 28.4)		0.0 (ns)	0.0 (ns)	0.0 (ns)	0.0 (ns)
Age (\bar{x} = 19.7; sd = 2.6)		2.6	2.6	2.0	2.0
Waiver (No Waiver) (71.6%)		27.6	27.6	30.5	30.3
Accession Cohort (FY90)					
FY88 (17.5%)			1.3 (ns)		3.4
FY89 (18.2%)			1.9 (ns)		4.7
FY91 (13.9%)			-1.9 (ns)		-6.7
FY92 (12.0%)			9.2		1.0 (ns)

Note: Tier 2A includes correspondence and occupational school graduates, GED and certificate of attendance/ completion holders, home schoolers, and non-high school graduates. Comparison group includes regular high school graduates, adult education program graduates, non-high school graduates with one semester of college, and regular college attendees. Descriptive statistics (i.e., percentages or mean values) appear in parentheses beside the variable labels.

**Relative Odds of 36 Month Attrition, Air Force
(Educational Credential Tier 2A)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Attrition Rate = 23.0					
Education (HSDG+)					
Tier 2A (.9%)	78.1	93.0	93.3		
Gender (Female)					
Male (78.6%)		-45.4	-45.3	-45.4	-45.3
Race/Ethnicity (White)					
Black (12.4%)		-17.5	-17.1	-17.6	-17.2
Hispanic (3.7%)		-31.2	-31.3	-31.1	-31.2
Other (3.0%)		-28.8	-28.5	-28.7	-28.5
Aptitude Category (IIIA)					
I & II (57.3%)		-20.9	-21.0	-20.9	-21.0
IIIB (15.2%)		12.0	12.9	11.3	12.1
IV (.3%)		-14.4 (ns)	-12.5 (ns)	-15.2 (ns)	-13.2 (ns)
Marital Status (Not Married)					
Married (11.1%)		-19.0	-13.8	-19.0	-13.7
Number of Dependents (\bar{x} = .1; sd = .4)		11.9	5.3 (ns)	12.2	5.6 (ns)
Body Mass (\bar{x} = 23.2; sd = 62.2)		2.1	2.0	2.1	2.0
Age (\bar{x} = 19.6; sd = 2.0)		-4.0	-3.9	-3.9	-3.7
Waiver (No Waiver) (90.9%)		10.2	9.7	10.7	10.2
Accession Cohort (FY90)					
FY88 (16.5%)			-22.4		-22.4
FY89 (17.4%)			-13.8		-13.8
FY91 (12.2%)			-0.1 (ns)		0.0 (ns)
FY92 (14.3%)			-13.2		-13.0

Note: Tier 2A includes correspondence and occupational school graduates, GED and certificate of attendance/completion holders, home schoolers, and non-high school graduates. Comparison group includes regular high school graduates, adult education program graduates, non-high school graduates with one semester of college, and regular college attendees. Descriptive statistics (i.e., percentages or mean values) appear in parentheses beside the variable labels.

**Relative Odds of 36 Month Attrition, Army
(Educational Credential Tier 2B)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Education (HSDG+)					
Tier 2B (8.0%)	122.2	138.1	142.6		
Gender (Female)					
Male		-58.1	-58.0	-55.3	-55.1
Race/Ethnicity (White)					
Black		-33.0	-32.8	-34.8	-34.6
Hispanic		-44.5	-45.0	-44.0	-44.3
Other		-30.7	-30.8	-31.2	-31.3
Aptitude Category (IIIA)					
I & II		-21.6	-21.5	-25.6	-25.6
IIIB		18.6	20.0	10.6	11.2
IV		23.9	29.6	11.22	13.6
Marital Status (Not Married)					
Married		10.2	14.5	13.8	18.2
Number of Dependents		5.7	2.1 (ns)	7.1	3.7
Body Mass		6.3	6.2	5.9	5.8
Age		-0.2 (ns)	-0.2 (ns)	0.1 (ns)	0.1 (ns)
Waiver (No Waiver)		16.9	16.3	18.3	17.7
Accession Cohort (FY90)					
FY88			-12.2		-11.3
FY89			-7.9		-3.0
FY91			6.6		5.3
FY92			2.5 (ns)		-0.7 (ns)

Note: Tier 2B includes correspondence and occupational school graduates, GED and certificate of attendance/completion holders, home schoolers, adult education program graduates, non-high school graduates with one semester of college, and non-high school graduates. Comparison group includes regular high school graduates, and regular college attendees.

**Relative Odds of 36 Month Attrition, Navy
(Educational Credential Tier 2B)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Education (HSDG+)					
Tier 2B (10.2%)	143.2	152.5	153.4		
Gender (Female)					
Male		-24.4	-24.2	-17.6	-17.2
Race/Ethnicity (White)					
Black		-9.1	-9.2	-10.2	-10.3
Hispanic		-21.1	-21.1	-15.2	-14.9
Other		-49.6	-49.6	-49.3	-49.1
Aptitude Category (IIIA)					
I & II		-21.3	-21.4	-27.8	-27.8
IIIB		13.0	13.1	-1.3 (ns)	-1.3 (ns)
IV		35.5	35.4	16.0	13.3
Marital Status (Not Married)					
Married		0.0 (ns)	-0.9 (ns)	2.8 (ns)	1.6 (ns)
Number of Dependents		3.9	4.8	6.1	7.1
Body Mass		0.0 (ns)	0.0 (ns)	0.0 (ns)	0.0 (ns)
Age		2.0	2.0	2.0	2.0
Waiver (No Waiver)		26.1	26.0	30.5	30.3
Accession Cohort (FY90)					
FY88			4.7		3.4
FY89			1.7 (ns)		4.7
FY91			-2.5 (ns)		-6.7
FY92			7.9		1.0 (ns)

Note: Tier 2B includes correspondence and occupational school graduates, GED and certificate of attendance/completion holders, home schoolers, adult education program graduates, non-high school graduates with one semester of college, and non-high school graduates. Comparison group includes regular high school graduates, and regular college attendees.

**Relative Odds of 36 Month Attrition, Air Force
(Educational Credential Tier 2B)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Education (HSDG+)					
Tier 2B (1.6%)	40.0	53.2	54.2		
Gender (Female)					
Male		-45.4	-45.3	-45.4	-45.3
Race/Ethnicity (White)					
Black		-17.5	-17.1	-17.6	-17.2
Hispanic		-31.0	-31.1	-31.1	-31.2
Other		-28.6	-28.4	-28.7	-28.5
Aptitude Category (IIIA)					
I & II		-21.0	-21.1	-20.9	-21.0
IIIB		11.9	12.7	11.3	12.1
IV		-14.9 (ns)	-12.9 (ns)	-15.2 (ns)	-13.2 (ns)
Marital Status (Not Married)					
Married		-19.1	-13.8	-19.0	-13.7
Number of Dependents		12.1	5.4 (ns)	12.2	5.6 (ns)
Body Mass		2.1	2.0	2.1	2.0
Age		-4.1	-3.9	-3.9	-3.7
Waiver (No Waiver)		10.4	9.9	10.7	10.2
Accession Cohort (FY90)					
FY88			-22.5		-22.4
FY89			-13.8		-13.8
FY91			0.0 (ns)		0.0 (ns)
FY92			-13.1		-13.0

Note: Tier 2B includes correspondence and occupational school graduates, GED and certificate of attendance/completion holders, home schoolers, adult education program graduates, non-high school graduates with one semester of college, and non-high school graduates. Comparison group includes regular high school graduates, and regular college attendees.